PROCEEDINGS

OF THE

MADRAS GOVERNMENT

IN THE

PUBLIC WORKS DEPARTMENT

IRRIGATION BRANCH,

FOR THE

MONTH OF OCTOBER 1906.

Printed by Authority.

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1906.

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PUBLIC WORKS DEPARTMENT

(IRRIGATION).

FOR THE MONTH OF OCTOBER 1906.

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Funds.—A sum of Rs. 120 from the reserve under the head "35. Protective Irrigation Works", placed at the disposal of the Collector of Vizagapatam towards the cost of the entertainment of a temporary clerk for the preparation of estimates for famine-relief works in the Vizagapatam Agency.	23rd Oct., No. 1083 I.	...	......

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GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

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IRRIGATION,

FOR THE MONTH OF OCTOBER 1906.

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Subject.	Number and Date of Order.	Numbers and Dates of previous Orders.
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Excess Expenditure.—The Examiner, Public Works Accounts, authorized to pass the — of Rs. 4,018 incurred during 1905–1906 under "Provincial, 43. Minor Works and Navigation—Agricultural Works" in the Trichinopoly division.	5th do. do. No. 1055 I.	......
Watcher.—The continued employment, till 31st July 1906, of a — on Rs. 4 *per mensem* to guard the tools and plant of the Ganjám Investigation Party at Berhampur, sanctioned.	5th do. do. No. 1056 I.	2nd Oct. 1905, No. 932 I.
Funds.—The sum of Rs. 29,520 sanctioned from the grant for the Bhavanasi tank project under the head "35. Construction of Protective Irrigation Works", added to the reserve.	5th do. do. No. 1057 I.	......

Subject.	Number and Date of Order.	Numbers and Dates of previous Orders.
Land.—A notification for the acquisition of — required for the construction of a new leading channel from the head sluice of the Kongan channel in Govindanattucheri village, Kumbakónam taluk, Tanjore district, ordered to be published in the *Fort St. George Gazette.*	6th Oct. 1906, R. No. 34 I.	......
Land.—A notification for the acquisition of — required for the excavation of distributary channels in certain villages in the Chidambaram taluk, South Arcot district, ordered to be published in the *Fort St. George Gazette.*	6th do. do. R. No. 35 I.	......
Land.—Notifications for the acquisition of — required for the Kambaladinne branch channel and for the Main channel, Mopad Reservoir project, in the Nellore district, ordered to be published in the *Fort St. George Gazette.*	6th do. do. No. 36 I.	......
Erratum in G.O., No. 929 I., dated 30th August 1906, sanctioning an estimate for special repairs during 1905–1906 to the establishment quarters at West Tammileru escape, Kistna district.	6th do. do. No. 1058 I.	......
Chart of the triangulation of the Gódávari Survey.—A —, of seasons 1901 to 1904, received from the Deputy Surveyor-General, Calcutta, forwarded, with remarks, to the Superintending Engineer, I Circle.	6th do. do. No. 1059 I.	11th April 1906, Nos. 409–10 I. 30th Aug. 1906, Nos. 930–31 I. & file.
Lands.—Letter from the Superintending Engineer, II Circle, returning the statement of — temporarily acquired for the Swarnamukhi channel, Divi Pumping project, in Perligedda village, Bandar taluk, Kistna district, recorded.	8th Oct. 1906, No. 1061 I.	14th Sept. 1906, No. 978 I.
Irrigation Cess Fund.—Proceedings of the Board of Revenue submitting a report on the operations of the — during 1905–1906, communicated to the officers concerned.	8th do. do. No. 1062 I.	......
Triennial Revenue Report of the Public Works Department, Irrigation Branch.—Letter from the Secretary, Society of Arts, London, acknowledging with thanks the receipt of a copy of the — for the three years ending 1904–1905, recorded.	9th do. do. No. R. 37 I.	......
Triennial Revenue Report of the Irrigation Branch, United Provinces.—The receipt of a copy of the — for the triennium ending 31st March 1905, recorded.	9th do. do. No. R. 38 I.	5th Mar. 1904, No. 252 I., &c.
Land.—A notification for the acquisition of — required for the construction of a lascar's shed at Lakhanapuram in connection with the Nagavali project, in Parvatipuram taluk, Vizagapatam district, ordered to be published in the *Fort St. George Gazette.*	9th do. do. No. R. 39 I.	......
Land.—A notification for the acquisition of — required for the improvements of the Mahal channel in Jagannapeta village, Sarvasiddhi taluk, Vizagapatam district, ordered to be published in the *Fort St. George Gazette.*	9th do. do. No. R. 40 I.	......
Land.—A notification for the acquisition of — required for excavating a drainage channel in Kidaripatty village, Mélúr taluk, Madura district, ordered to be published in the *Fort St. George Gazette.*	10th do. do. No. R. 41 I.	......

Subject.	Number and Date of Order.	Numbers and Dates of previous Orders.
Land.—A notification for the acquisition of — required for the extension of Kothamaricuppam tank bund in Tiruvallúr taluk, Chingleput district, ordered to be published in the *Fort St. George Gazette.*	10th Oct. 1906, No. R. 42 I.	......
Land.—A notification for the acquisition of — required for the diversion of the Veppangi sub-branch channel in Veppangi village, Chicacole taluk, Ganjám district, ordered to be published in the *Fort St. George Gazette.*	10th do. do. No. R. 43 I.	......
Land.—Directing the Tahsildar of Amalapur to procure the temporary occupation and use of — required for raising Vynateyam left bank from Gannavaram aqueduct to Gorinkala drain in Gannavaram village, Amalapur taluk, Gódávari district.	11th do. do. No. 1065 I.	......
Lands.—Letter from the Superintending Engineer, II Circle, returning the statement of — acquired for the distributary of the Talagadadívi channel No. I, Divi Pumping project, in Bandar taluk, Kistna district, recorded.	12th do. do. No. 1069 I.	19th Sept. 1906, No. 1002 I.
Objectionable items.—Orders on the statement of — in the accounts of Executive Engineers, I Circle, remaining unremedied to end of March 1906 (supplemental).	12th do. do. No. R. 44 I.	27th Aug. 1906, No. 911 I. 28th Mar. 1906, No. 353 I. & file.
Triennial Revenue Report of the Bombay Presidency.—Receipt of a copy of the — for the triennium ending 1904–1905, recorded.	13th do. do. No. R. 45 I.	......
Investigation of projects by the Cuddapah-Anantapur Investigation party.—Estimates, aggregating Rs. 5,500, for preliminary expenses during the current year in connection with the —, sanctioned.	15th do. do. No. 1072 I.	......
Excess outlay.—The Examiner, Public Works Accounts, authorised to pass the — of Rs. 1,300 incurred during 1905–1906 on the preliminary investigation of projects in the Cuddapah district.	15th do. do. No. 1073 I.	......
Excess outlay.—The Examiner, Public Works Accounts, authorised to pass the — of Rs. 290 incurred during 1905–1906 on the preliminary investigation of projects in the Anantapur district.	15th do. do. No. 1074 I.	......
Excess outlay.—The Examiner, Public Works Accounts, authorised to pass the — of Rs. 137 incurred on the work of investigating the site selected for the Boradapalli reservoir, Ganjám district.	16th do. do. No. 1075 I.	12th Mar. 1906, No. 293 I.
Panguni channel, Trichinopoly District.—Petition from certain ryots of Panguni Keelmugam, etc., villages complaining of inadequate water-supply in the — and making suggestions for improving the same, forwarded to the Superintending Engineer, VI Circle, for consideration and remarks along with his proposals relating to the improvements to the Iyen and Peruvalai channels.	18th do. do. No. 1076 I.	3rd June 1905, No. 529 I. 10th Sept. 1901, No. 681 I.
Objectionable items.—Letter from the Superintending Engineer, IV Circle, replying to the remarks in the statement of — for the quarter ending March 1906 (supplemental), recorded.	16th do. do. No. R. 46 I.	17th Aug. 1906, No. 879 I. 25th June 1906, No. 694 I. & file.

Subject.	Number and Date of Order.	Numbers and Dates of previous Orders.
Land.—A notification for the acquisition of — required for the diversion of Bairi main channel in Nyra village, Chicacole taluk, Ganjám district, ordered to be published in the *Fort St. George Gazette.*	16th Oct. 1906, No. R. 47 I.	......
Objectionable items.—Orders on an extract from the divisional statement of — in the accounts of the Bellary division for the month of July 1906.	19th do. do. No. R. 48 I.	......
Objectionable items.—Orders on the statement of — in the accounts of Executive Engineer, III Circle, remaining unremedied to end of June 1906.	19th do. do. No. R. 49 I.	28th June 1906, No. 705 I. 30th Mar. 1906, No. 361 I. & file.
Land.—A notification for the acquisition of — required for the formation of the left bank of the drainage course from the Kongan channel to the Manniyar river in certain villages in the Kumbakónam taluk, Tanjore district, ordered to be published in the *Fort St. George Gazette.*	20th do. do. No. R. 50 I.	......
Erratum — in G.O., No. 983 I., dated 15th September 1906, sanctioning an estimate for providing apron in front of Nos. 1 and 2 calingulahs of Pasimuthan Odai, Lower Coleroon Anicut system.	23rd do. do. No. 1084 I.	......
Erratum — in G.O., No. 954 I., dated 4th September 1906, passing orders on the demands for incomplete works of 1905–1906 and new works proposed to be undertaken during the current year.	23rd do. do. No. 1085 I.	......
Transfer of funds.—Certain—under Imperial—Irrigation, 42. Major Works—Working expenses, sanctioned.	23rd do. do. No. $\frac{1085}{A}$ I.	......
Irregular expenditure.—Office-note from the Examiner, Public Works Accounts, pointing out that an expenditure of Rs. 8,562 has been incurred without a sanctioned estimate on the work "Annual maintenance of Composite punts for 1906–1907", communicated to the Superintending Engineer, II Circle, for remedying the irregularity.	24th do. do. No. 1086 I.	......
Irregular expenditure.—Office-note from the Examiner, Public Works Accounts, pointing out certain — incurred under 42. Major Works—Maintenance and Repairs in the Gódávari Western division, communicated to the Superintending Engineer, I Circle, for remedying the irregularities.	24th do. do. No. 1087 I.	......
Irregular expenditure.—Office-note from the Examiner, Public Works Accounts, pointing out certain — incurred under 43. Agricultural repairs in the Tanjore division, communicated to the Superintending Engineer, V Circle, for remedying the irregularity.	26th do. do. No. 1094 I.	......
Land.—A notification for the acquisition of — required for the straight cut of the Mangalore river, in Mémáthúr village, Máyavaram taluk, Tanjore district, ordered to be published in the *Fort St. George Gazette.*	22nd do. do. No. R. 51 I.	......
Objectionable items.—Orders on the statement of — in the accounts of Executive Engineers, VI Circle, remaining unremedied to end of June 1906.	22nd do. do. No. R. 52 I.	5th Oct. 1906, No. 1055 I. 11th Sept. 1906, No. 968, I. & file.

Subject.	Number and Date of Order.	Numbers and Dates of previous Orders.
Land.—A notification for the acquisition of — required for closing breaches in the Cooum river at Korattúr anicut in Korattúr village, Saidapet taluk, Chingleput district, ordered to be published in the *Fort St. George Gazette.*	24th Oct. 1906, No. R. 53 I.	......
Land.—A notification for the acquisition of — required for the right flood bank of the Poiney Anicut in Orukambut village, Chittoor taluk, North Arcot district, ordered to be published in the *Fort St. George Gazette.*	24th do. do. No. R. 54 I.	......
Land.—A notification for the acquisition of — required for the improvement of Tirumalarajupet Cheyyar channel, in Obili village, Pullampet taluk, Cuddapah district, ordered to be published in the *Fort St. George Gazette.*	24th do. do. No. R. 55 I.	......
Land.—A notification for the acquisition of — required for the Talagadadívi channel No. II, Divi Pumping Project, in Marripálem village, Bandar taluk, Kistna district, ordered to be published in the *Fort St. George Gazette.*	24th do. do. No. R. 56 I.	......
Land.—A notification for the acquisition of — required for the Talagadadívi channel No. II, Divi Pumping Project, in Talagadadívi village, Bandar taluk, Kistna district, ordered to be published in the *Fort St. George Gazette.*	24th do. do. No. R. 57 I.	......
Land.—Directing the Special Deputy Collector, Divi Pumping Project, to procure the temporary occupation and use of — required for the Talagadadívi channel No. II, Divi Pumping Project, in Talagadadívi village, Bandar taluk, Kistna district.	24th do. do. No. R. 58 I.	......
Land.—Directing the Special Deputy Collector, Divi Pumping Project, to procure the temporary occupation and use of — required for Talagadadívi channel No. II, Divi Pumping Project, in Marripálem village, Bandar taluk, Kistna district.	24th do. do. No. R. 59 I.	......
Objectionable items.—Orders on the statement of — in the accounts of Executive Engineers, IV Circle, remaining unremedied to end of June 1906.	24th do. do. No. R. 60 I.	25th May 1906, No. 574 I. 17th Aug. 1906, No. 879 I. & file.
Land.—Letter from the Superintending Engineer, I Circle, returning the statement of — temporarily acquired for the restoration of the Dummagudem Anicut Works, Gódávari district, recorded.	29th do. do. No. 1096 I.	17th Sep. 1906, No. 993 I.
Works in the South Arcot division.—The date of completion of certain —, extended.	31st do. do. No. 1100 I.	......
Waste lands under the Pedalanka channel, Kistna district.—Orders directing that the ordinary darkhast rules be made applicable to the —, communicated to the officers concerned.	31st do. do. No. 1101 I.	11th Sept. 1903, No. 877 I.
Land.—Letter from the Superintending Engineer, II Circle, returning the statement of — temporarily acquired for No. 1 distributary of Talagadadívi channel, No. II, Divi Pumping Project, in Bandar taluk, Kistna district, recorded.	31st do. do. No. 1103 I.	5th Oct. 1906, No. 1051 I.

Subject.	Number and Date of Order.	Numbers and Dates of previous Orders.
Land.—Letter from the Superintending Engineer, II Circle, returning the statement of — temporarily acquired for the Mandapakala channel, Divi Pumping Project, in Bandar taluk, Kistna district, recorded.	31st Oct. 1906, No. 1104 I.	5th Oct. 1906, No. 1049 I.
Land.—Letter from the Superintending Engineer, II Circle, returning the statement of — temporarily acquired for No. 2 distributary of Talagadadívi channel, No. II, Divi Pumping Project, in Bandar taluk, Kistna district, recorded.	31st do. do. No. 1105 I.	5th Oct. 1906, No. 1052 I.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 1035 I., 1st October 1906.

Kandukur-Vyasasamudram tank, Cuddapah district

Ordered that the Honourable the Resident in Mysore be informed of the circumstances in which the demarcation of the waterspread of the — was undertaken.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following papers :—

I

G.O., No. 1028, Revenue, dated 5th November 1901.
„ „ 296 I., dated 16th March 1905.

II

G.O., No. 1177 I., dated 30th November 1905.

Read—the following papers :—

G.O., Nos. 296-97 *I., dated* 16*th March* 1905.
„ „ 861-62 *I.* „ 14*th September* 1905.

Letter—from the Hon'ble Mr. A. Williams, I.C.S., Offg. Resident in Mysore.
To—the Joint Secretary to the Government of Madras, Public Works Department (Irrigation Branch).
Dated—Bangalore, the 18th November 1905.
No.—6778.

I have the honour to acknowledge the receipt of your letter No. 297 I., dated the 16th March 1905, regarding the demarcation of the waterspread of the Kandukur-Vyasasamudram tank in the Cuddapah district.

2. From the local enquiries instituted by the Mysore Darbar, it has been ascertained that the officials of the Chelur firka have not removed any of the boundary marks, and it is suggested that the allegation made against them is the outcome of a complaint made by the villagers against a contractor named Ramaiya regarding an illegal levy of fees for scraping grass grown in the bed of the Chelur tank.

3. All the stones fixed by the Madras Government, except the one in Survey No. 16 of the Nimkayalapalli village, Bagepalli taluk, are reported to be in their proper places. It would appear that the stone originally fixed in Survey No. 16 at the point marked O in the accompanying sketch was removed further north by the contractor Ramaiya and fixed at a point marked ▭ with a view to diminishing its area and increasing the waterspread of the tank.

Return is requested.

4. The Darbar submit that any demarcation of the lands comprised in the villages of the Mysore State should not be made without reference to them and they would therefore be glad to be informed of the circumstances under which the demarcation in question was made.

Order—No. 1177 *I., dated* 30*th November* 1905.

Communicated to the Superintending Engineer, III Circle, who is requested to furnish the information referred to in paragraph 4 of the Resident's letter.

(True Extract.)

J. P. Davidson,
Joint Secretary to Government,
Irrigation Branch.

To the Superintending Engineer, III Circle, with sketch.
,, Chief Engineer for Irrigation.

III

G.O., No. 888 I., dated 20th August 1906.

Read—the following papers :—

G.O., No. 1177 *I., dated* 30*th November* 1905.

Letter—from the Hon'ble Mr. S. M. Fraser, c.i.e., Resident in Mysore.
To—the Joint Secretary to the Government of Madras, Public Works Department (Irrigation Branch).
Dated—Bangalore, the 31st July 1906.
No.—4345.

I have the honour to invite a reference to this office letter No. 6778, dated the 18th November 1905, regarding the demarcation of the waterspread of the Kandukur-Vyasasamudram tank in the Cuddapah district and to enquire how the matter now stands.

Order—No. 888 *I., dated* 20*th August* 1906.

Communicated to the Superintending Engineer, III Circle, who is requested to expedite the submission of the information called for in the Government Order read above.

(True Extract.)

C. A. Smith,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, III Circle.

IV

Letter—from G. F. Handcock, Esq., Superintending Engineer, III Circle.
To—the Chief Engineer for Irrigation.
Dated—Cuddapah, the 13th August 1906.
No.—3715.

With reference to G.O., No. 1177 I., dated 30th November 1905, I have the honour to report, for the information of Government, that, in compliance with the orders contained in G.O., No. 930 I., dated 5th November 1901, on the subject of the demarcation of lands lying within the waterspread of tanks, an estimate, amounting to Rs. 215, for demarcating the waterspread of the Kandukur-Vyasasamudram tank in the Cuddapah division was sanctioned in November 1903, and the work put in hand in September 1904.

2. The local officers of this department who carried out the demarcation do not seem to have been aware of the fact that a portion of the waterspread of the tank lay in Mysore territory.

3. The injunction contained in paragraph 4 of the Resident's letter recorded with the Government Order under reply will be kept in view when dealing with future estimates for demarcating lands in the waterspread of tanks bordering on Mysore territory.

4. The tracing received with the Government Order is herewith returned.

V

From the Superintending Engineer, III Circle, dated 24th August 1906, No. 4009.
" Resident in Mysore, dated 22nd September 1906, No. 5416.

Order—No. 1035 I., dated 1st October 1906.

The following letter will be sent.

[Here enter No. 1036 I., dated 1st October 1906.]

(True Extract.)

C. A. Smith,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation, } with copy of letter.
" Superintending Engineer, III Circle, } with copy of letter.

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

Letter No. 1036 I., 1st October 1906.

Kandukur-Vyasasamudram tank, Cuddapah district

Explaining, with remarks, the circumstances in which the demarcation of the waterspread of the — was undertaken.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Letter—from

C. A. SMITH, Esq.,

Ag. Joint Secretary to the Government of Madras,

Public Works Department

(Irrigation Branch),

To

The Honourable the RESIDENT in MYSORE.

Sir,

With reference to paragraph 4 of your letter No. 6778, dated 18th November 1905, on the subject of the demarcation of the waterspread of the Kandukur-Vyasasamudram tank, in the Cuddapah district, I am directed to explain the circumstances in which the demarcation was undertaken.

2. A case having occurred in which certain lands in the waterspread of a tank in the Kistna district had been assigned for cultivation by Revenue authorities without reference to the Public Works Department, it was directed as a safeguard against such assignment of lands that the actual extent of waterspread of each tank at full tank level should be determined. It is reported that in pursuance of these orders the Superintending Engineer, III Circle, sanctioned an estimate for demarcating the lands lying within the waterspread of the Kandukur-Vyasasamudram tank, but the local officers do not seem to have been aware of the fact that a portion of the waterspread of the tank lay in Mysore territory. I am, however, to state that, as desired by the Darbar, the demarcation of lands lying in Mysore State will not be undertaken, in future, without reference to them.

I have the honour to be,

Sir,

Your most obedient servant,

C. A. SMITH,

Ag. Joint Secretary to Government,

Irrigation Branch.

Ootacamund,

1st *October* 1906.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1037 I., 1st October 1906.

Staff boat for use on the Vedaranniyam canal, Tanjore district

A revised estimate, amounting to Rs. 1,960, for constructing a —, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

I

G.O., No. 7 I., dated 3rd January 1906.

Abstract.—Sanctioning an estimate, amounting to Rs. 2,350, for constructing a first-class staff boat for use on the Védáranniyam canal.

II

Letter—from Lieut.-Col. W. M. Ellis, R.E., Superintending Engr., V Circle.
To—the Chief Engineer for Irrigation.
Dated—the 28th August 1906.
No.—393 E.I.

With reference to the estimate Rs. 2,350 sanctioned for constructing a staff boat for the Védáranniyam canal, I have the honour to forward a note on this subject sent to the Executive Engineer, Negapatam, and the fresh estimate drawn up by that officer on the instructions given. It will be noticed that copper is not provided for in the new boat although it is for use in tidal water. The reasons for this is set forth in the note. I have made further enquiries and find that copper sheeting is not used by any except Government boats on the Buckingham canal, and so long as they are cleaned, scraped, and tarred once a year no injury results. *This however is necessary.* On the whole I am against copper sheeting, and consider that the boat should be scraped and tarred yearly all over the bottom as is done with the private boats. If however the copper is considered desirable this can be provided within the amount of the estimate sanctioned.

Your approval is sought for building the staff boat on the lines now proposed as the design as originally sanctioned cannot be built locally.

Enclosures.

Note on Staff Boat, Védáranniyam Canal.

An estimate for a new staff boat for the Védáranniyam canal on the design of Mr. Wickham was sanctioned by Government, G.O., No. 7 I., dated 3rd January 1906, for Rs. 2,350. This boat measured 44 feet in length × 8 feet in breadth and height 8′ 10½″ to top of upper decking over cabin from bottom of keel. In addition to this the tiller projected 1 foot above the deck.

The draft of the boat is not shown on the plan but taking it as a minimum of 1 foot the head-way required for such a boat for a width of 8 feet would be 9 feet above high water level spring tide. The ribs of this boat were of angle irons with wood planking and copper sheeting outside. This appears to me to be an utterly faulty arrangement, as not only is there difficulty in fastening

the butt-ends of timbers on an iron rib $2\frac{1}{2}'' \times 2\frac{1}{2}'' \times \frac{1}{4}''$ angle iron, but galvanic action between the iron and the copper would be set up involving very rapid deterioration of the former. Even if copper is not to be used. I am of opinion wood ribs are better construction and especially so as a boat with iron ribs cannot be built locally, while one with wood ribs can.

2. At the request of Mr. O'Connell, the Executive Engineer, Kistna Central, has made an estimate for a boat with composite hull as above but of different dimensions, viz., 36 feet long 7′ 10″ wide and depth from keel to upper deck 7′ 10″ and requiring a headway of 7′ 10″ or say 8 feet from high water spring tide for a width of 8 feet under bridges. This boat including cost of erection at Negapatam after construction at Bezwada is estimated at Rs. 2,785.

As regards headway there were only 2 feet from upper deck of the existing boat to the soffit of Kaduviar bridge when the writer passed under it on 20th May 1906. The gauge reading was then 2 feet and the boat was heavily loaded. The Executive Engineer must report after enquiry the headway available from high water spring tide to the masonry of the arch at the lowest bridge on the canal, and to what height above water the upper deck of the new boat must be restricted leaving 1 foot clear between upper deck and bridge at high water spring tide.

It appears doubtful whether copper sheathing is necessary for the boats on the canal. The local boats are not sheathed, neither is the boat at present in use. Enquiry should be made regarding the injury done by borers to boats in use, and old boats should be inspected when opportunity offers when they are exposed for repairs. Our own boat should also be examined and a report made regarding the condition of her hull and any deterioration due to borers and time she has been in use.

The great objection to a coppered boat besides the first cost is, she cannot be caulked without removing the copper and the copper is likely to be injured by running aground which all boats constantly do in this canal. Further a coppered boat should be copper fastened or destructive galvanic action will be set up between the fastenings and the copper.

Report to accompany the estimate for constructing a second-class staff boat for use in Negapatam Division.

		RS.
Amount of estimate	... ...	1,960

An estimate, amounting to Rs. 2,350, was sanctioned for this purpose in G.O., No. 7 I., dated 3rd January 1906. The design of the boat sanctioned was, however, found to be faulty in details and unsuitable for reasons stated in the note of the Superintending Engineer, dated June 1906. The chief points noticed by him are (1) the difficulty of jointing the woodwork to angle iron ribs of small section, (2) the deterioration sure to occur owing to galvanic action between copper and iron, (3) the difficulty of constructing at Negapatam a boat with ribs of angle irons, and (4) the question of the headway in the three existing bridges on the canal. The necessity for copper sheeting is also not made out while the difficulty in periodically caulking a boat provided with copper sheeting is great. Owing to boats frequently running aground the copper sheet is likely to get injured.

On these considerations a design was called for for a boat with dimensions and parts suitable for use in the canal, the general model being the one designed by the Bezwada Executive Engineer. A design is accordingly prepared where all the objectionable parts described in the above paragraph are eliminated. The ribs of angle iron are replaced by wooden ribs of sufficient thickness $3\frac{1}{2}'' \times 3\frac{1}{2}''$. The question of the headway has been dealt with fully—please see calculations in separate sheet attached. The deck is made to overhang 3 feet over the kitchen doorway as suggested by the Superintending Engineer.

As regards the lasting qualities of a boat with uncoppered hulls, I am convinced that such a boat if carefully looked after and caulked once a year would last more than 30 years. Boat No. 63 a cargo boat which as a rule runs aground at least in three places every trip from Negapatam to Védáranniyam was constructed in 1882 and is still plying in the canal. So also boat No. 65 another cárgo boat built in 1882. These are the two oldest boats and their condition at present is fair.

Our own boat has been in use for 11 years and its hull is in good condition. The hulls of old boats cannot be inspected at Negapatam as they seldom dock boats here for repairs. But I have seen several big boats docked at Tópputurai and the hulls have not been injured by borers.

An ample rate has been allowed for the hull building, for I think there should be considerable wastage of wood in actual construction.

Jegannatha Pillai, a piece-worker who built the present staff boat plying in the canal, has stated he would be prepared to build a boat of the pattern here designed. From my knowledge of the ports on this coast, especially of Negapatam and Muttupet, I may say that the construction of this boat here is not a very difficult matter.

U. S. Ramaswami Aiyar,
Offg. Executive Engr., Negapatam Divn.

III

Note by the Chief Engineer for Irrigation.

In G.O., No. 7 I., dated 3rd January 1906, an estimate, amounting to Rs. 2,350, was sanctioned for constructing a first-class staff boat for use on the Védáranniyam canal. But the present Superintending Engineer, V Circle, having found the design of the boat unsuitable on technical grounds, requested the Executive Engineer, Negapatam Division, to prepare a revised estimate on the lines indicated by him. A revised estimate of Rs. 1,960, prepared accordingly, is now submitted with the dimensions and parts of the boat adapted for its use on the canal. It is stated that, unlike the boat originally designed, the one now estimated for can be built locally. As the present design is cheaper and more suitable, it is recommended that the revised estimate be sanctioned.

C. A. Smith,
Ag. Chief Engineer for Irrigation.

24th September 1906.

Order—No. 1037 I., dated 1st October 1906.

The following revised estimate is sanctioned in supersession of the estimate sanctioned in G.O., No. 7 I., dated 3rd January 1906 :—

Imperial.

Irrigation.

43. Minor Works and Navigation.

Class II. Minor Works and Navigation for which Capital and Revenue Accounts are kept.

Védáranniyam Canal.

Negapatam Division.

Revenue Account.

5. Tools and Plant.

4. Navigation Plant.

Constructing a staff boat for use in the Védáranniyam canal.

	RS.
Estimate	1,960

2. This sanction is registered as No. 149 I. of 1906–1907.

(True Extract.)

C. A. Smith,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, V Circle, with plans and estimate.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1038 I., 1st October 1906.

Floating plant of the Kistna Delta System

A revised statement showing the revaluation of the — for 1906-1907, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

I

G.O., No. 488 I., dated 8th May 1906.

II

Memorandum No. 1591, dated 5th May 1906.

It is observed from the revaluation statement (column 13) of the floating plant of the Kistna Delta system printed with G.O., No. 217 I., dated 28th February 1905, that in order to arrive at the "present book value", one-tenth of the original cost of the plant has been multiplied by its estimated length of life, and the cost of special repairs deducted from it. But in deducing the present book value shown in column 13 of the revaluation statement for 1906–1907, this method has not been adopted. The Superintending Engineer is, therefore, requested to explain how the values in the latter statement have been arrived at.

C. A. Smith,
Ag. Chief Engineer for Irrigation.

To the Superintending Engineer, II Circle, with revaluation statement.

ENCLOSURE.

REVALUATION statement of Irrigation floating plant for 1906–1907.

Register number.	Description of boats.	Date of construction.	Measurements of plants. Hull over all. Length.		Breadth.		Depth.		Draft when loaded.		Tonnage according to Navigation rules.		Estimated further life of boats.	Estimated cost of special repairs for the rest of life.	Value of plant. Original cost.	Present book value calculated by usual method.	Present book value by revaluation.	Remarks.
1	2	3	4		5		6		7		8		9	10	11	12	13	14
			FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	G.	N.	YEARS.	RS.	RS.	RS.	RS.	
4	Iron punt	1859-60 received from Gódávari.	60	3	10	3	2	9	2	0	26	22	10	800	2,812	34	1,000	
18	Do.	1859-60 received from Gódávari.	60	0	10	0	2	10	2	6	26	22	10	500	2,186	91	500	
25	Do.	1862-63	44	0	12	0	3	0	2	6	25	21	10	500	4,091	— 182	1,500	
30	Do.	1872-73	40	6	7	6	2	2	1	11	11	10	10	500	1,524	8	500	
31	Do.	1873-74	40	6	7	6	2	2	1	11	11	10	10	500	2,181	54	500	
33	Do.	1874-75	40	6	7	6	2	2	1	11	11	10	10	500	1,960	— 12	500	
34	Do.	1875-76	40	6	7	6	2	2	1	11	11	10	10	1,000	1,960	— 89	1,000	
61	Composite punt	1883-84	72	0	13	0	3	6	2	6	40	34	10	2,600	2,160	— 55	1,800	
65	Do.	1884-85	60	0	13	0	3	6	2	6	34	29	10	1,000	1,900	— 20	1,000	
66	Do.	1885-86	60	0	13	0	3	6	2	6	34	29	10	1,000	2,013	67	1,500	
66	Do.	1889-90	60	0	13	0	3	6	2	6	34	29	10	500	2,238	58	1,700	
68	Do.	1877-78	72	0	13	0	3	6	2	6	40	34	10	500	3,000	— 37	2,000	
69	Do.	1882-83	72	0	13	0	3	6	2	6	40	34	10	500	2,600	83	1,900	
72	Do.	1883-84	60	0	13	0	3	6	2	6	40	34	10	500	2,600	93	1,900	
74	Do.	1884-85	72	0	13	0	3	6	2	6	40	34	10	500	2,600	— 80	1,900	
12	Staff boat	1881-82	50	0	8	0	2	6	2	0	30	25	..	..	1,621	..	..	Condemned.

Dis. No. 1441 *R./4-T. & P., dated 25th October* 1905.

Forwarded to the Superintending Engineer, II Circle.

L. L. WICKHAM,
Executive Engr., Kistna Northern Divn.

III

Letter—from M. Brown, Esq., Executive Engineer, Kistna Central Division.

To—the Superintending Engineer, II Circle.

Dated—the 11th July 1906.

No.—205-S.E./3-T. & P.

With reference to your No. 80-K.C., dated 12th May 1906, and 132-K.C., dated 6th June 1906, I have the honour to state that the figures shown in column 13 of the original statement were only approximate and not calculated according to the method adopted in G.O., No. 542 I., dated 26th September 1890. The correct method is now adopted and a revised statement is submitted herewith.

2. Calculating by this method for composite punt No. 51 the book value comes to *minus* Rs. 440. If this is made to last for 10 years more special repairs have to be executed at a cost of Rs. 2,600 for which a new punt can practically be constructed.

3. Annual repairs have now been carried out this year and with ordinary annual repairs the punt can last for four years more. Taking this as the future life of the punt, the book value has been entered.

Enclosure.

Revised revaluation statement of Irrigation Floating Plant for 1906–1907.

Register number.	Description of boat.	Date of construction.	Measurements of Plant. Hull over all. Length.		Breadth.		Depth.		Draft when loaded.		Tonnage according to Navigation rules.		Estimated further life of boats.	Estimated cost of special repairs for the rest of life.	Value of Plant. Original cost.	Present book value calculated by usual method.	Present book value by revaluation.	Remarks.
1	2	3	4		5		6		7		8		9	10	11	12	13	14
			FT.	IN.	FT.	IN.	FT.	IN.	FT.	IN.	G.	N.	YEARS.	RS.	RS.	RS.	RS.	
4	Iron punt	1859-60 (received from Gódávari).	60	3	10	3	2	9	2	0	26	22	10	800	2,812	34	2,010	
18	Do.	1859-60 (received from Gódávari).	60	0	10	0	2	10	2	6	26	22	10	500	2,186	91	1,686	
25	Do.	1862-63	41	0	12	0	3	0	2	6	25	21	10	500	4,091	— 182	3,591	
30	Do.	1872-73	40	6	7	6	2	2	1	11	11	10	10	500	1,524	8	1,024	
31	Do.	1873-74	40	6	7	6	2	2	1	11	11	10	10	500	2,181	54	1,681	
33	Do.	1874-75	40	6	7	6	2	2	1	11	11	10	10	500	1,960	— 12	1,460	
34	Do.	1875-76	40	6	7	6	2	2	1	11	11	10	10	1,000	1,960	— 89	960	
51	Composite punt	1883-84	72	0	13	0	3	6	2	6	40	34	4	..	2,160	— 55	864	
55	Do.	1884-85	60	0	13	0	3	6	2	6	34	29	10	1,000	1,900	— 20	900	
56	Do.	1885-86	60	0	13	0	3	6	2	6	34	29	10	1,000	2,013	67	1,013	
65	Do.	1889-90	60	0	13	0	3	6	2	6	34	29	10	500	2,238	58	1,738	
68	Do.	1877-78	72	0	13	0	3	6	2	6	40	34	10	500	3,000	— 37	2,500	
69	Do.	1882-83	72	0	13	0	3	6	2	6	40	34	10	500	2,600	83	2,100	
72	Do.	1883-84	60	0	13	0	3	6	2	6	40	34	10	500	2,600	93	2,100	
74	Do.	1884-85	72	0	13	0	3	6	2	6	40	34	10	500	2,600	— 80	2,100	
12	Staff boat	1881-82	50	0	8	0	2	6	2	0	30	25	..	..	1,621	..	..	Condemned.
35	Iron punt	1872-73	39	9	11	0	2	10	1	7	21	18	8	200	400	60	120	

No. 324 *I., dated* 13*th September* 1906.

Copy forwarded to the Chief Engineer for Irrigation with reference to his Memorandum No. 1591, dated 5th May 1906.

A. C. Langston,
Superintending Engineer, II Circle.

IV

Note by the Chief Engineer for Irrigation.

With the statement showing the cost of maintenance of the floating plant of the Kistna Delta System for 1906–1907 approved in the order read above the Superintending Engineer, II Circle, submitted also a revaluation statement of the floating plant. As it was observed that the method adopted for the calculation of the "present book value" was not correct, the statement was returned to the Superintending Engineer for revision. He now submits a revised statement, which, it is recommended, may be approved.

C. A. Smith,
Ag. Chief Engineer for Irrigation.

24*th September* 1906.

Order—No. 1038 I., dated **1st October 1906.**

The revised statement showing the revaluation of the floating plant of the Kistna Delta System submitted by the Superintending Engineer, II Circle, is approved.

(True Extract.)

C. A. Smith,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1039 I., 1st October 1906.

Working of the Staff boats of the Buckingham Canal for 1905-1906

Statements showing the —, recorded.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers :—

I

Letter—from F. W. Cornwell, Esq., Officiating Executive Engineer, Chingleput Division.
To—the Superintending Engineer, V Circle.
Dated—the 31st August 1906.
No.—5035-S.E.

I have the honour to forward herewith three statements A, B and C showing the working of staff boats of the Buckingham canal in the Chingleput division for the year 1905–1906.

Enclosures.

A.—Staff boat statement of the Buckingham canal in the Chingleput division for 1905–1906.

Item number.	Name of boat.	Boats.		Date of construction or purchase and cost.		Monthly rate of rent.	Amount recovered up to end of March 1906 (actual collections).	Amount spent on repairs to end of March 1906.	Amount reserved for repairs and reconstruction up to end of March 1906.
		Number of boat.	Class of boat.	Year.	Cost.				
1	2	3	4	5	6	7	8	9	10
					RS.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1	Staff boat	9	II class ..	1891	900	16 0 0	2,798 13 11	1,737 13 1	1,061 0 10
2	Do.	10	Special ..	1893	1,742	30 0 0	2,173 13 10	1,857 0 2	816 13 8
3	Do.	11	II class ..	1895	1,250	16 0 0	1,952 11 2	932 7 8	1,020 3 6
4	Traveller's boat	8	I class ..	1903	500	24 0 0	311 14 5	174 9 9	137 4 8
	Total ..	..	..	..	..	..	7,237 5 4	4,701 14 8	2,535 6 8
	Balance brought forward, less deficit (*vide* G.O., No. 1121 I., dated 16th November 1905).	..	..	..	..	..	..	..	—3,034 1 6
	Balance available for repairs and reconstruction ..	..	..	..	..	..	..	..	— 498 10 10

B.—Statement showing actual amount at the credit of each existing staff boat of the Buckingham canal in the Chingleput division at end of 1905–1906, as compared with the amount required for repairs, calculated at $\frac{1}{12}$ of the original cost for every year of service.

Boat number.	Name of boat.	Balances.	
		Required.	Actual.
		RS.	RS.
9	Staff boat, II class	1,125	1,061
10	Do. special	1,885	317
11	Do. II class	1,144	1,020
8	Traveller's boat	126	137
	Total ..	4,280	2,535

C.—Statement showing the calculation for arriving at the amount noted in column 3 of statement B for 1905–1906.

No.	Number and name of boat.	Date of completion or purchase and cost.		Annual provision for repairs at $\frac{1}{12}$ of original cost.	Amount of provision to be made for repairs at $\frac{1}{12}$ of cost price calculating from the date of purchase or completion.	
		Year.	Cost.		Years.	Amount.
			RS.	RS.		RS.
9	Staff boat, II class	1891	900	75	15	1,125
10	Do. special	1893	1,742	145	13	1,885
11	Do. II class	1895	1,250	104	11	1,144
8	Traveller's boat	1903	500	42	3	126

No. 402 *E.I., dated* 5*th September* 1906.

Copy forwarded to the Chief Engineer for Irrigation with three statements in original.

W. M. Ellis, Lt.-Col., R.E.,
Superintending Engineer, V Circle.

II

No. 3268, dated 11th September 1906.

Forwarded to the Examiner, Public Works Accounts, for verification of figures representing receipts.

(By order.)

T. W. S. Smyth,
Asst. Chief Engineer for Irrigation.

III

No. 4784-B./A., dated 20th September 1906.

Verified and returned.

C. R. T. Balston,
Examiner, Public Works Accounts.

To the Chief Engineer for Irrigation.

IV

Note by the Chief Engineer for Irrigation.

The accompanying statements received from the Superintending Engineer, V Circle, show the working of the staff boats of the Buckingham canal for 1905–1906. The total earnings of these boats up to the end of the year amounted to Rs. 7,237–5–4 and the charges to Rs. 4,701–14–8, leaving a balance of Rs. 2,535–6–8. Deducting from this sum, Rs. 3,034–1–6, which represents the deficit on the boats sold, the net deficit of the boat account up to end of 1905–1906 is Rs. 498–10–10.

C. A. Smith,
Ag. Chief Engineer for Irrigation.

25*th September* 1906.

Order—No. 1039 I., dated 1st October 1906.

Recorded.

(True Extract.)

C. A. Smith,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, V Circle.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*	
Regd.		*Spare copies*	

G.O., No. 1040 I., 2nd October 1906.

Chidikada big tank, Vizagapatam Division

An estimate, amounting to Rs. 3,180, for improvements to the —, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

Letter—from W. J. HOWLEY, Esq., Officiating Superintending Engineer, I Circle.
To—the Chief Engineer for Irrigation
Dated—Dowlaishweram, the 23rd June 1906.
No.—723-V.Z.

I have the honour to forward herewith estimates, amounting to Rs. 2,870, for improvements to the Chidikada big tank for favour of approval and transmission to Government for sanction.

2. The report accompanying the estimates explains the necessity for the proposed works.

3. A copy of the Executive Engineer's letter No. 147-S.E. of 13th June 1906, which gives the amount of revenue derived from the ayacut under the tank, is enclosed.

ENCLOSURES.

Letter—from the Executive Engineer, Vizagapatam Division.
To—the Superintending Engineer, I Circle.
Dated—the 13th/16th June 1906.
No.—147-S.E.

[*Reference*—Your No. 596-V.Z., dated 18th May 1906.]

I have the honour to report that the revenue derived from the ayacut under the big tank of Chidikada village for the last five years is Rs. 4,843-8-0 as shown below :—

	RS.	A.	P.
Fasli 1311 ...	1,014	2	0
" 1312 ...	1,015	10	0
" 1313 ...	1,010	14	0
" 1314 ...	809	12	0
" 1315 ...	993	2	0
	4,843	8	0

Report to accompany the estimate for improvements to Chidikada big tank, Golgonda taluk, Vizagapatam district.

Estimate ... ... RS. 3,180

Ayacut and Revenue.—The tank has an ayacut of 183 acres and the revenue derived is Rs. 969 per annum.

Supply source.—The tank is fed by a channel with an open head taking off from a jungle stream across which a mud dam is put by the ryots every year. Owing to the difficulty and cost of making the dam the channel gets an insufficient supply. It is now proposed to substitute a new roughstone dam, 204 feet long. The supply channel is very much silted up and it is now proposed to clear the same to a bed width of 4 feet, depth 3 feet, and a fall of 1 in 1,000.

A cheap head sluice at a lump sum cost of Rs. 200 is proposed to be built at the head of the channel to regulate supply when necessary.

Surplus arrangements.—The tank has a catchment area of 1 square mile and the discharge is 500 cubic feet per second. The old weir at the right flank is ruined by the soil in rear being scoured away and cannot be repaired. The estimate therefore provides for a new masonry weir, 60 feet long. Capable of discharging with 2 feet head, the old weir being abandoned and the site closed.

The surface fall along the surplus channel is 1½ in 100, being 9 feet between the site of the new weir and the Pinna tank which is 600 feet below, and which receives the surplus water. This fall is partly overcome by a drop of 7 feet in the new weir, and partly by the natural fall of the ground.

Provision is made for cutting and widening the surplus channel for a length of 100 feet from the weir where the ground is high.

All works will be carried out in accordance with the standard specification.

II

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, I Circle, submits an estimate, amounting to Rs. 2,870, for improving the Chidikada big tank, Vizagapatam Division. The tank has a catchment area of one square mile with a calculated discharge of 500 cusecs. The ayacut under the tank is 183 acres, yielding an average revenue of Rs. 969 a year. It is stated that this tank receives its supply through an open head channel taking off from a jungle stream across which the ryots put up every year a temporary dam made of brushwood, mud, etc. It is further stated that the supply channel is silted up and the existing weir at the right flank of the tank is not in good order.

The improvements proposed therefore consist in—

(1) constructing a roughstone dam, 204 feet long, across the jungle stream;

(2) building a new weir, 60 feet long, at the left flank of the tank, the existing weir being abandoned and its site closed; and

(3) clearing and widening the supply and excavating a new surplus channel.

The following alterations and addition have been made in the estimate by this office:—

(*a*) The crest level of the roughstone dam has been reduced from + 66·00 to + 65·00;

(*b*) the bed fall of the supply channel has been altered from 1 in 350 to 1 in 1,000;

(*c*) the bottom widths of the body wall, front and rear returns of the tank weir have been increased to 6′, 4′ 3″ and 3′ 6″, respectively, and the top of the retaining wall of the apron has been lowered to bed level of the surplus channel (+ 43·00);

(*d*) provision has now been made for a cheap sluice at the head of the supply channel to regulate the supply whenever necessary.

The estimate, as revised, amounts to Rs. 3,180 and is recommended for sanction.

The tank has until recently been in charge of the Revenue Department, but it has been included by the Superintending Engineer in the revised list of minor works in charge of the Public Works Department.

C. A. Smith,
Ag. Chief Engineer for Irrigation.

21*st September* 1906.

Order—No. 1040 I., dated 2nd October 1906.

The following estimate is sanctioned :—

Provincial.

Irrigation.

43. Minor Works and Navigation.

Class IV—Minor Works for which neither Capital nor Revenue accounts are kept.

(*a*) In charge of the Public Works Department.

Vizagapatam Division.

Original Works.

Improvements to the Chidikada big tank.

	RS.
Estimate	3,180

2. This sanction is registered as No. 150 I. of 1906–1907.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, I Circle, with plans and estimate.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*	
Regd.		*Spare copies*	

G.O., Nos. 1041, 1042 I., 2nd October 1906.

Lascars' sheds and store-room at the Cauvery-Veerasholanar regulator, Cauvery Delta System

Forwarding a copy of the Proceedings sanctioning an estimate, amounting to Rs 2,339, for constructing —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

From the Superintending Engineer, V Circle, dated 13th August 1906, No. 369 E.I.

ENCLOSURE.

Report to accompany the estimate for constructing lascars' sheds and store at Cauvery-Veerasholanar regulator.

	RS.
Amount of estimate	1,930

The improvements to Veerasholanar Head have been completed and five lascars have been appointed to work the shutters. As no suitable accommodation is available for these men near the head works, it is proposed to build them quarters on a site close by, with a store, as shown on the accompanying survey and as provided for in the accompanying estimate.

9th March 1903.

H. A. FURNELL,
Supervisor, Public Works Department.

II

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, V Circle, submits an estimate, amounting to Rs. 1,930, for constructing lascars' sheds and store-room at the Cauvery-Veerasholanar regulator, Cauvery Delta system. It is stated that, at present, no accommodation is available near the head works for the lascars employed on the regulator. The estimate is recommended for sanction.

2. It is presumed that the amount of compensation (Rs. 150), provided for in the estimate, for land required for the work has been fixed in consultation with the local Revenue officers.

3. The work is classed as "Unremunerative" and will probably be completed by 31st March 1907.

24th September 1906.

C. A. SMITH,
Ag. Chief Engineer for Irrigation.

Order—No. 1041 I., dated 2nd October 1906.

The following estimate is sanctioned :—

Imperial.
Capital expenditure not charged to Revenue.
49. Irrigation.
Cauvery Delta System.
Open Capital Account.
Tanjore Division.
I. Works.
2. Main Canals and Branches.
K. Buildings.
Unremunerative work.

Constructing lascars' sheds and store-room at the Cauvery-Veerasholanar regulator.

		RS.
Estimate—		
I. Works	... ...	1,930
II. Establishment	... ...	409
	Total ...	2,339

2. This sanction is registered as No. 151 I. of 1906–1907 and will expire on 31st March 1907.

3. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 1042 I., dated 2nd October 1906.]

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, V Circle, with plans and estimate.
,, Examiner, Public Works Accounts.

Endorsement—No. 1042 I., dated 2nd October 1906.

Forwarded.

(By order.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1043 I., 2nd October 1906.

Peranai Head works, Periyar Project

Letter from the Government of India sanctioning, with remarks, the extension of the date of completion of the work of remodelling the —, communicated to the officers concerned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

G.O., No. 814 I., dated 26th July 1906.

ABSTRACT.—Sanctioning a re-revised estimate, amounting to Rs. 4,07,874, for remodelling the head works at Peranai, Periyár Project, and ordering that a copy of the Proceedings be forwarded to the Government of India for information.

II

Letter—from Mr. L. M. JACOB, C.S.I., Secretary to the Government of India, Public Works Department (Civil Works—Irrigation).
To—the Joint Secretary to the Government of Madras, Public Works Department (Irrigation Branch).
Dated—Simla, the 13th September 1906.
No.—1321.

I am directed to acknowledge the receipt of your endorsement No. 815 I., dated the 26th July 1906, forwarding a copy of Madras Government Proceedings sanctioning a re-revised estimate, amounting to Rs. 4,07,874, including establishment charges, for remodelling the Peranai Head Works, Periyár Project.

2. With reference to paragraph 2 of G.O., No. 814 I., dated 26th July 1906, I am to point out that under paragraph 2155 VI, Volume II, Public Works Department Code, as modified by Standing Order No. 45, dated 21st May 1902, the sanction of the Government of India should have been applied for to the extension of date from 31st March 1906 to 31st March 1907 for the completion of the work.

The extension of date to 31st March 1907 is hereby sanctioned.

Order—No. 1043 I., dated 2nd October 1906.

Communicated to the officers concerned.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 1045 I., 2nd October 1906.

Demands under 43. Minor Works and Navigation, Class IV
(b) Minor Works, Revenue Department

Orders on the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

G.O., No. 954 I., dated 4th September 1906.

ABSTRACT.—Orders on the demands for incomplete works of 1905–1906 and new works proposed to be undertaken during the current year.

II

From the Superintending Engineer,	III Circle,	dated	8th Mar.	1906,	No. 932.
To the ,,	III ,,	,,	10th ,,	,,	,, 904.
From the ,,	III ,,	,,	9th July	,,	,, 2956 I.
To the Board of Revenue, Revenue Settlement		,,	19th ,,	,,	,, 2614.
From the ,,	,,	,,	23rd ,,	,,	,, 4406.
To the Superintending Engineer,	III Circle,	,,	3rd Aug.	,,	,, 2840.
Telegram to the Suptg. Engineer,	IV ,,	,,	15th ,,	,,	
,, from the ,,	IV ,,	,,	21st ,,	,,	
From the Superintending Engineer,	II ,,	,,	13th Sept.	,,	No. 320 I.

Order—No. 1045 I., dated 2nd October 1906.

In paragraph 7 of the order read again above it was stated that separate orders would issue as regards the demands made by Superintending Engineers for Class IV (*b*) Minor Works, Revenue Department. These demands together with those since made aggregate Rs. 25,206 as detailed in the statement appended to these Proceedings. The reserve at the disposal of Government amounts to Rs. 16,181 which, together with the sum of Rs. 7,000 surrendered by the Superintending Engineer, IV Circle, from the grant for the Salem division under "Minor Original Works," will be re-appropriated to meet the above demands to the extent shown in column 5 of the statement.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineers, I, II, III, IV, V and VI Circles.
,, Examiner, Public Works Accounts.
,, Board of Revenue (Revenue Settlement).

Appendix to G.O., No. 1045 I., dated 2nd October 1906.

STATEMENT showing the allotments proposed for incomplete and new works under Class IV (*b*) Minor Works, Revenue Department, in charge of Public Works Department.

Division.	Number.	Class and name of work.	Demand made by Superintending Engineers.	Amount proposed to be allotted.	Remarks.
1	2	3	4	5	6
		CLASS IV (*b*) MINOR WORKS, REVENUE DEPARTMENT, IN CHARGE OF PUBLIC WORKS DEPARTMENT.	RS.	RS.	
		Original Works.			
Bellary ..	1	Nettur ruined tank	1,800	1,800	
	2	Bairasamudram tank	1,200	1,200	
	3	Yerlakatta minor tank	1,000	1,000	
	4	Restoring Naranappakunta tank	3,850	1,825	
North Arcot ..	5	Masonry works across Mamandur high level channel.	336	336	
Chingleput ..	6	Vyasarpadi tank—extending weir No. 1 ..	1,900	1,900	
	7	Sempoondy tank—improvements to—	3,000	3,000	
Tinnevelly ..	8	Lump sum (for incomplete works)	2,550	2,550	
		Total, Original works ..	15,636	13,611	
		Repairs.			
Gódávari Western.	9	Akkropalle Gokavaram Pedda tank	850	850	
Kistna Northern ..	10	Repairs and improvements to Pamideran tank ..	250	250	
Cuddapah ..	11	Lump sum (for incomplete works)	4,660	4,660	
Chingleput ..	12	Nungambakam tank—repairing flood damages ..	1,500	1,500	
Tinnevelly ..	13	Lump sum (for incomplete works)	2,310	2,310	
		Total, Repairs ..	9,570	9,570	
		Total, Original works and Repairs ..	25,206	23,181	
		Establishment ..	..	5,332	
		Tools and Plant ..	..	348	
		Grand Total ..	..	28,861	

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1046 I., 4th October 1906.

Bhavanasi Tank Project, Nellore district

Communicating to the Superintending Engineer, II Circle, proceedings of the Board of Revenue regarding the possibility of utilising the water-supply to be provided by the — to command a larger area than that originally estimated, and requesting him to submit a supplemental estimate for extending the distributaries and to report whether there are likely to be any savings in the estimate for the project from which the cost of the distributaries now proposed can be met.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

I

G.O., Nos. 599-600 I., dated 21st June 1905.

ABSTRACT.—Approving an estimate of Rs. 1,30,050 for the Bhavanasi tank project, Nellore district, and forwarding a copy of the Proceedings to the Government of India for sanction.

G.O., Nos. 26-27 I., dated 8th January 1906.

ABSTRACT.—Sanctioning the estimate of Rs. 1,42,200 including indirect charges for the Bhavanasi tank project, and forwarding a copy of the Proceedings to the Government of India for information.

G.O., No. 319 I., dated 21st March 1906.

ABSTRACT.—Communicating to the officers concerned, letter from the Government of India pointing out that local Governments have no powers of sanction as regards protection irrigation works, and sanctioning the revised estimate of Rs. 1,42,200 for the Bhavanasi project, Nellore district.

II

Endt. No. 171-C./06—1, Revenue, dated 5th February 1906.

Referred to the Board of Revenue for report with reference to paragraph 2.

(By order.)

F. B. EVANS,
Under Secretary to Government.

To the Board of Revenue (Revenue Settlement).

III

Proceedings of the Board of Revenue (Revenue Settlement, Land Records and Agriculture), Mis. No. 5265, dated 31st August 1906.

Read—the following papers :—

Board's Proceedings, Mis. No. 4543, *dated* 8*th August* 1905.

Endorsement No. 171-*C.*/06—1, *Revenue, dated* 5*th February* 1906, *on G.O., No.* 26 *I., dated* 8*th January* 1906.

Board's Reference thereon, No. 612, *dated* 13*th February* 1906.

Letter—from R. MORRIS, Esq., I.C.S., Collector of Nellore.
To—the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture.
Dated—the 22nd February 1906.
No.—592-D./Ver.

Board's Reference thereon, No. 825, *dated* 1*st March* 1906.

Letter—from N. S. BRODIE, Esq., M.A., I.C.S., Collector of Guntúr.

To—the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture.

Dated—the 18th August 1906.

No.—Dis. 453-R./Genl.

Adverting to Board's Reference No. 825, dated 1st March 1906, I have the honour to state that the Tahsildar and Deputy Tahsildar, Ongole, who were deputed to investigate the matter have made a rough inspection of the country to be affected by the Bhavanasi project and reported—

Villages.	Extent to be irrigated.
	ACS
1. Addanki ...	1,993·03
2. Manikeswaram	144·57
3. Chekrayapalem ...	60·05
4. Gopalapuram ...	100·00
5. Narasimhapuram	150·00
Total ...	2,447·65

(1) That nearly 2,447·65 acres in the villages noted in the margin would be available for irrigation and be brought under irrigation within ten years if distributary channels be constructed to carry water to all parts.

(2) That the soils in the villages are regar loam, red loam, and regar sand which can be advantageously irrigated under the new project.

(3) That as the ryots are anxious to be benefited by the project, they are likely to prepare the lands for irrigation promptly. But as the Tahsildar, etc., are not professional men, they are rather diffident about the extent estimated by them. The records available in this office and those obtained from the Collector, Nellore, relating to the project do not show how the Special Tahsildar who investigated the project at first arrived at 841 acres as the only extent irrigable under the project in a period of ten years as referred to in paragraph 8 of Mr. Sidney Preston's note, dated 11th September 1905. The irrigation map is not available to be consulted. I beg to add further that the Sub-Collector, Ongole, is of opinion that to try to obtain more detailed information would entail as much work as the original investigation itself.

Resolution—Mis. No. 5265, *dated* 31*st August* 1906.

The letter from the Collector of Guntúr read above, reporting on the possibility of utilizing the water-supply to be provided by the Bhavanasi project, so as to command a larger area than the originally estimated ayakat of 841 acres, will be submitted to Government, with the following remarks, with reference to their endorsement No. 171-C./06—1, Revenue, dated 5th February 1906.

2. Adverting to the concluding portion of Mr. Brodie's letter, the Board observes that, so far as can be gathered from the correspondence printed in G.O., No. 599 I., dated 21st June 1905, the original ayakat of 841 acres was apparently fixed by the Officer in charge of the Nellore Investigation Party and that the duty of the Special Tahsildar was merely confined to the investigation of the question whether the extent of land intended by the Public Works officer to be irrigated (841 acres) was available and suitable for irrigation and, if so, in what villages. In fixing the area irrigable at 841 acres, the Public Works officer appears to have assumed that the project was designed wholly for *wet* irrigation and that at least 250,000 c. ft. of water would be required for the irrigation of a single acre of *wet* crop, whereas the limit of 100,000 c. ft. per acre allowed in paragraph 8 of Mr. Sidney Preston's Note printed in G.O., No. 26 I., dated 8th January 1906, obviously presupposes the utilization of the project water exclusively for the irrigation of *dry* crops. The Board has already stated in paragraph 2 of its report on the Cheruvukommapalem project printed in G.O., No. 145 I., dated 9th February 1906, that, under the *dry* schemes, ryots may not generally take project water except in bad years and that in other years there would be some risk of the water-supply being allowed to run to waste without yielding any return to Government. It will, therefore, be assumed for the present purposes that the 451 acres of ryotwari dry lands included in the original ayakat fixed for the Bhavanasi

project will be transferred to wet as proposed in paragraph 3 (1) of its Proceedings Mis. No. 1284, dated 3rd March 1905, printed at pages 20 and 21 of G.O., No. 599 I., dated 21st June 1905; and as the water-supply required for the irrigation of one acre of wet crop will ordinarily suffice for the irrigation of 3 acres of dry crop, the project will afford water-supply for the irrigation of *dry* crops on an additional area of 1,047 acres. The Collector states that a total extent of 2,447·65 acres is available for irrigation in the villages noted on the margin,* but has not reported whether the irrigable area shown against the village of Addanki (in which the total extent under cultivation aggregates 11,276 acres) includes or excludes the 910 acres expected to be irrigated in that village under the dry scheme from the Cheruvukommapalem tank project. Even excluding the last mentioned area from the figures reported by the Collector, the remaining irrigable area will suffice, as will be seen from the marginal table,† for the utilization of the water-supply that will be afforded by the project for the irrigation of *dry* crops.

Village.	Area irrigable. ACS.
* 1. Addanki	1,993·03
2. Manikeswaram	144·57
3. Chekrayapalem	60·05
4. Gopalapuram	100·00
5. Narasimhapuram	150·00
Total ...	2,447·65

† Total irrigable area as reported by the Collector	2,447·65
Deduct 910 acres irrigable under the Cheruvukommapalem project in the village of Addanki ...	910
Deduct also the area of ryotwari dry land to be transferred to wet.	451
Total deduction ...	1,361
Remainder ...	1,086·65
Area of dry crops for the irrigation of which water-supply will be available under the project ...	1,047

(True Extract.)

L. D. SWAMIKANNU,
Ag. Secretary.

To the Secretary to Government, Revenue Department.
,, Collector of Guntúr.

Order—No. 1046 I., dated 4th October 1906.

The Proceedings of the Board of Revenue read above will be communicated to the Superintending Engineer, II Circle, with the request that he will be so good as to submit for sanction a supplemental estimate for extending the distributaries on the lines approved by the Chief Engineer for Irrigation in the case of the Mopad project a copy of which was communicated to the Superintending Engineer with the Chief Engineer's Memorandum No. 289-O., dated 20th August 1906.

2. The Superintending Engineer is also requested to report whether there are likely to be any savings in the estimate for the project from which the cost of the distributaries now proposed can be met.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle.
,, Examiner, Public Works Accounts.
,, Revenue Department.
,, Board of Revenue (Revenue Settlement).

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 1047 I., 4th October 1906.

Kistnapuram Project, Kurnool district

Ordered, with remarks, that the Government of India be informed that the — may be held in abeyance until the question of the Tungabhadra project is finally disposed of.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers:—

I

G.O., Nos. 31-32 I., dated 9th January 1906.

ABSTRACT.—Approving the estimate, amounting to Rs. 2,13,540, including the direct and indirect charges for the Kistnapuram project, Kurnool district, and forwarding it to the Government of India for sanction as a protective work.

II

Letter—from Mr. L. M. JACOB, C.S.I., Secretary to the Government of India, Public Works Department (Civil Works—Irrigation).
To—the Joint Secretary to the Government of Madras, Public Works Department (Irrigation Branch).
Dated—Simla, the 17th May 1906.
No.—664 I.

I am directed to acknowledge the receipt of your endorsement No. 32 I., dated the 9th January 1906, forwarding for sanction the Kistnapuram project in the Kurnool district.

2. Before orders are passed, I am to say that the area to be irrigated by this tank appears to fall within or near the commanded areas of the Tungabhadra and Kistna storage projects, and to request that, with the permission of His Excellency the Governor in Council, the alignments of the main canals, branch canals and distributaries, proposed for the Tungabhadra and Kistna canal storage projects, may be transferred to the sheets of the "canal map of the Madras Presidency compiled from the revenue surveys and the sketch maps of irrigation, scale 8 miles to 1 inch", and this office supplied with copies of the same as early as possible.

3. I am also to request that in future when submitting tank projects, which fall within or near the commanded areas of the Tungabhadra and Kistna storage schemes, it may be clearly stated whether the area under the former is commanded by the latter, and, if so, that the reasons for making independent provision may be given. Any part of the storage scheme alignments falling within the index map of tank projects should be shown on the latter with the reduced levels of full supply.

Order—No. 1047 I., dated 4th October 1906.

The Government of India will be informed that, as the Kistnapuram project is dependent to a considerable extent on the Gazuladinne project which, in G.O., No. 171 I., dated 12th February 1906, was ordered to lie over until orders of the Government of India on the Tungabhadra project were received, it may also be held in abeyance until the receipt of these orders.

2. The following letter will be sent.

[Here enter No. 1048 I., dated 4th October 1906.]

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation, with copy of letter.
" Superintending Engineer, III Circle.
" Examiner, Public Works Accounts.
" Revenue Department.
" Board of Revenue (Revenue Settlement).

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

Letter, No. 1048 I., 4th October 1906.

Kistnapuram Project, Kurnool district

Stating, with remarks, that the — may be held in abeyance until the question of the Tungabhadra project is finally disposed of.

No. 1048 I., 4TH OCTOBER 1906.

PUBLIC WORKS DEPARTMENT.

Irrigation.

LETTER—from

C. A. SMITH, ESQ.,
Ag. Joint Secretary to the Government of Madras,
Public Works Department,
Irrigation Branch,

To

THE SECRETARY TO THE GOVERNMENT OF INDIA,
PUBLIC WORKS DEPARTMENT.

SIR,

I am directed to acknowledge the receipt of your letter No. 664 I., dated 17th May 1906, observing that the area to be irrigated by the Kistnapuram project appears to fall within or near the area commanded by the Tungabhadra and Kistna Reservoir projects, and requesting that the alignment of main canals, branch channels and distributaries proposed for these projects may be transferred to the sheets of the canal map of the Madras Presidency.

2. I am to state that the Kistnapuram project depends to a considerable extent upon the Gazuladinne project which, in your letter No. 123 I., dated 27th January 1906, was ordered to lie over until orders were passed on the Tungabhadra project.

3. The lands to be irrigated by the Gazuladinne project having now been included in the area under the Tungabhadra project, His Excellency the Governor in Council considers that the Kistnapuram project also may be held in abeyance until the question of the Tungabhadra project is finally disposed of.

4. As regards the canal map of the Presidency asked for, I am to invite perusal of the map forwarded with my letter No. 1018 I., dated 22nd September 1906, in connection with the list of protective irrigation works under execution, sanctioned or nearly ready for sanction. On this map the relative positions of, and the areas commanded by, the several projects existing, investigated and under investigation in this Presidency are clearly marked.

5. The instructions conveyed in paragraph 3 of your letter under reply have been noted for future guidance.

I have the honour to be,
Sir,
Your most obedient servant,

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

OOTACAMUND,
4th October 1906.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1053 I., 5th October 1906.

Working of the staff boat of the Vedaranniyam Canal, Tanjore district

A review of the — for the year 1905-1906, recorded.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

Statement showing the date of completion or earnings of staff boats constructed or purchased in the Negapatam Division for 1905–1906.

Item number.	Name of boat.	Boat. Number of boat.	Boat. Class of boat.	Date of construction or purchase and cost. Year.	Date of construction or purchase and cost. Cost.	Monthly rent.	Amount recovered to end of March 1906, actual collection.	Amount spent on repairs up to end of March 1906.	Amount reserved for repairs and reconstruction up to end of March 1906.	Remarks.
					RS.		RS. A. P.	RS. A. P.	RS. A. P.	
1	Staff boat, "Jubilee Diamond."	1	4th	1898–99.	844	..	110 8 0	147 15 8	— 37 7 8	
	Balance spent less deficit to end of March 1905.	..	..	..	..	..	..	..	— 838 3 2	*Vide* G.O., No. 1005 I., dated 21st October 1905.
	Total available for repairs and reconstruction.	..	..	..	..	..	..	..	— 875 10 10	

U. S. RAMASWAMI AIYAR,
Offg. Ex. Engineer, Negapatam Division.

No. 405 *E.I., dated* 5*th September* 1906.

Copy forwarded to the Chief Engineer for Irrigation.

W. M. ELLIS, Lieut.-Colonel, R.E.,
Superintending Engineer, V Circle.

II

No. 3267, dated 11th September 1906.

Forwarded to the Examiner, Public Works Accounts, for verification of receipts and return.

(By order.)

T. W. S. SMYTH,
Under Secretary to Government.
Irrigatoin Branch.

III

No. 4825-B./A., dated 21st September 1906.

Returned duly verified.

C. R. T. BALSTON,
Examiner, Public Works Accounts.

IV

Note by the Chief Engineer for Irrigation.

The statement submitted by the Superintending Engineer, V Circle, with his endorsement read above shows the working of the staff boat of the Védáranniyam Canal for the year 1905–1906. The total earnings of the boat during the year amounted to Rs. 110–8–0 and the charges to Rs. 147–15–8, the deficit in the boat account up to the end of the year 1905–1906 being Rs. 875–10–10.

C. A. SMITH,
2nd October 1906. *Ag. Chief Engineer for Irrigation.*

Order—No. 1053 I., dated 5th October 1906.

Recorded.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, V Circle.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1054 I., 5th October 1906.

Transfer of funds

Certain — under 43. Minor Works and Navigation in the Coimbatore Division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper:—

No. 6918 E./3 C., dated 19th September 1906.

APPLICATION to the Superintending Engineer, IV Circle, for a reappropriation of budget grants.

PROPOSED NEW GRANT.

Departmental and service head.	Item number of budget.	Works.	Amount of estimate.	Outlay to end of previous year.	Original grant for current year.	Existing grant for current year.	Proposed increase.	Grant as now proposed.
1	2	3	4	5	6	7	8	9
		ORIGINAL WORKS.	RS.			RS.	RS.	RS.
		Major.						
43. Irrigation, etc., not kept, Public Works Department, Agricultural Works.	..	Rivetting with rough-stone the right margin of the Cauvery at Marvapalem set ..	11,600	..	..	5,000	(1) 2,940	7,940
		Total ..	..	..	..	5,000	2,940	7,940

PROPOSED REDUCTION.

Departmental and service head.	Item number of budget.	Works.	Amount of estimate.	Outlay to end of previous year.	Original grant for current year.	Existing grant for current year.	Proposed reduction.	Amount at which grant for work will stand after reduction.
10	11	12	13	14	15	16	17	18
		Extensions and Improvements.			RS.	RS.	RS.	RS.
43. Irrigation kept Revenue Account.	..	Thadapalli channel.	..	..	2,000	2,000	(2) 1,708	292
	..	Arkencottah ,,	..	..	500	500	(3) 492	8
	..	Kalingaroyen ,,	..	..	2,000	740	(4) 740	..
		Total ..	..	..	..	3,240	2,940	300

Explanation of necessity for reappropriation—

(1) Work in progress and the additional grant is required.
(2) *to* (4) There are no estimates to work out the full grant and hence the transfer to (1).

Forwarded to the Superintending Engineer, IV Circle, with reference to his endorsement No. 517 C. of 5th September 1906 for sanction, if approved.

H. T. Keeling,
Executive Engineer.

No. 261 *I.*/45 *B.*-2, *dated* 27*th September* 1906.

Copy forwarded to the Chief Engineer for Irrigation for sanction with reference to his No. 3185 of 3rd August 1906.

H. H. O'Connell,
Superintending Engineer, IV Circle.

Order—No. 1054 I., dated 5th October 1906.

The following transfers of funds are sanctioned :—

Irrigation.

Provincial.

43. Minor Works and Navigation.

Coimbatore Division.

From Class II. Minor Works for which Capital and Revenue Accounts are kept. Revenue Account.	RS.	RS.	*To* Class V. Agricultural Works. Original Works.	RS.
Thadapalli channel—			Revetting with roughstone the right margin of the Cauvery at Marvapalem set	2,905
Extensions and improvements	1,708		Establishment	668
Establishment	393	2,101	Tools and plant	43
Arkencottah channel—				
Extensions and improvements	492			
Establishment	113	605		
Kalingaroyen channel—				
Extensions and improvements	740			
Establishment	170	910		
Total ...		3,616		3,616

(True Extract.)

C. A. Smith,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, IV Circle.
,, Examiner, Public Works Accounts.

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906.
Regd. }

Enclosures

Spare copies

G.O., No. 1060 I., 6th October 1906.

Upper Penner Reservoir Project, Anantapur District.

The action of the Chief Engineer for Irrigation in ordering the detailed investigation of the —, approved.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

I

Letter—from H. E. CLERK, Esq., Superintending Engineer on Special duty.
To—the Chief Engineer for Irrigation.
Dated—the 13th February 1906.
No.—340.

I have the honour to forward a very brief preliminary report on the Upper Pennér Project in the Anantapur district. Various proposals have been made for utilizing the Pennér in that district—*vide* page 69 of my preliminary report for the Irrigation Commission. The scheme now proposed takes the place of the Timmapuram or Bukkacherla Project there alluded to.

2. It is obvious that, given a feasible site, a reservoir across the river is much better than an anicut which would only impound a portion of the supply, and as far as I can judge from the report, I consider that the project in its present form is the best that can be devised.

3. The Assistant Engineer does not give the data on which he has arrived at the conclusion that 7,000 millions cubic feet can be stored in all but the very worst years. I have asked him for these, but do not consider it necessary to delay the submission of this report for want of this information.

4. The Assistant Engineer has fixed the area of irrigation at 32,400 acres. This is single-crop paddy at 216,000 cubic feet per acre. My own idea, however, is that it would be advisable to make this as far as possible into a dry-crop project. The country is one which needs water as badly as any in the Presidency and I believe that water for dry crops would be freely taken. It is already very largely the custom to grow dry crops under the tanks in Anantapur and there is little doubt that an extension of this method of cultivation would be readily adopted. This, however, will be decided later on after consultation with Revenue officers of the district.

5. *Returns.*—No deductions have been made for remissions and failures to irrigate the whole area in times of short supply which must undoubtedly occur. On the other hand, no credit has been taken for second-crop cultivation of which there will be a certain amount in good years. The net return may therefore be accepted provisionally. The area affected is one which stands almost more in need of irrigation than any in the Presidency. Not only is the rainfall very low in all seasons but the soils are very light so that good rainfed crops are almost unknown in this area.

The project is undoubtedly most valuable for famine protective purposes and the only point which I have to ask you to consider is whether this quantity of water can be abstracted from the Pennér without injury to the Tungabhadra Project. My own belief is that, in the great majority of years, there will be ample water from the Tungabhadra itself combined with the supply from the Papaghni, the Chitravati and the Cheyyar, whereas in bad years the supply down the Pennér will be too insignificant to affect the Tungabhadra Project one way or the other.

6. Of all the projects for which I have submitted preliminary reports in Anantapur and Cuddapah districts I consider this the most truly famine protective and I would strongly recommend its complete investigation at a very early date. I would ask for very early orders on this subject in order that the investigation of the project may be completed at once. Until orders are received the party has little or no work to do.

ENCLOSURE.

Letter—from H. W. MILNER, Esq, Assistant Engineer, Cuddapah-Anantapur Investigation Party.
To—the Superintending Engineer on Special duty.
Dated—Madanapalle, the 10th February 1906.
No.—187.

As desired in your No. 104, dated the 13th January 1906. I have the honour to forward herewith a forecast of the preliminary report on the Upper Pennér Reservoir Project in the Anantapur district together with a sketch map and a first rough estimate of cost. The report itself is being prepared with the least possible delay, and it will be submitted at an early date. The figures here given will, of course, in some cases be subject to slight revision in the report as a result of further and more careful consideration :—

Forecast.

The works proposed in connection with this scheme are—

(*a*) A reservoir on the Pennér the dam of which would be situated about one mile above the village of Perur in the south-west corner of the taluk of Dharmavaram;

(*b*) a surplus weir to be formed by cutting through a saddle in the ridge which encloses the reservoir on the west or left flank; such a cutting would lead into a large wide valley otherwise separated from the reservoir by a high ridge and the whole flood discharge of the river could be safely passed by that route;

(*c*) a head sluice in the main dam on the right flank;

(*d*) a main canal supplied therefrom having a length of about 14 miles, and leading to the watershed of the Anantapur minor basin which basin is drained by the Tadakaliru and the Pandamêru;

(*e*) a small head sluice in the main dam on the left flank;

(*f*) a channel supplied therefrom having a length of about three miles, which serves a marginal area on the west side of the Pennér and tails into the surplus channel near the point at which the latter falls into that river;

(*g*) a small sluice on the extreme right flank of the reservoir from which the Perur Peddacheruvu (Imperial) would be supplied as required: this is a good tank but it has a very small catchment and supports exceedingly precarious cultivation.

In the Anantapur minor basin, the only works proposed are—

(*a*) An anicut near Palcherla across the stream into which the main canal discharges its water at the watershed;

(*b*) a small irrigation channel, approximately 10 miles long, leading to a stream which falls into the large tank of Brahmanayeluru (Imperial), and which thus commands all the lands in the angle between the two rivers referred to.

It is to be borne in mind that the works in the Anantapur minor basin do not in one sense form an essential part of the scheme. It is believed that all the ayacut required could be found in the Pennér valley itself, but there are several strong reasons (*vide* Preliminary Report) for concluding that what is here proposed will form the better scheme.

The main canal a few furlongs from the watershed is bifurcated. One branch leads ultimately into Togarakunta tank, and thence to Palcherla anicut, and it is proposed to pass the major portion of the water by that route; the other leads to Bhadrapuram tank and thence also to the anicut, but the water has a longer journey.

The character of the watershed requires a note. It is not exactly, as would appear from the map, a chain of hills through a gap in which the channel is conveyed. The watershed lies to the westward of the line of "hills" shown. On reaching it, the country falls very abruptly to the eastward and is cut up into deep ravines and gorges, the "hills" being really the isolated high ground, and ridges between these ravines. The tops of the lowest "hills" are level with the watershed.

The area of the whole catchment basin above the dam is 2,025 square miles. The total British area is 622·3 square miles, and 1,402·7 square miles are in the Mysore State. Both these areas are, however, made up of several portions completely detached from one another.

The water available for storage may be estimated by these independent methods—

(*a*) By ascertaining the yield from the whole basin and making allowance for existing cultivation above the reservoir;

(*b*) by studying discharge tables calculated from three years of gauge readings in conjunction with the rainfall tables; and

(*c*) from data obtained at a small anicut 28 miles below the proposed dam. The question of available water is one of real difficulty especially in the case of a river like the Pennér, and it

will be fully and carefully treated of in the "report". My conclusion is that 7,000 millions of cubic feet of water may be relied upon in all years but the very worst. Pavagada with an average rainfall of 19·65 on 34 years is, I believe, the driest taluk in the presidency.

The available capacity of the reservoir I have proposed is 7,178 millions of cubic feet. The height from deepest part of river bed to F.T.L. is 73 feet, or 83 feet to parapet of dam. This maximum height, however, is only for a short length. The wings of the dam are of earth. The whole length of dam is about 14 furlongs,—9 furlongs on the left flank and 5 furlongs on the right.

The main channel from the reservoir to the watershed passes through country having bold undulations like broad earth waves. Trial-pits have been put down on the line throughout its length, and up to depths of six feet (the depth examined) nothing harder than grey moorum is usually met with. The most frequent arrangement is 2 feet to 3 feet of red soil generally mixed with gravel and small pebbles, and having grey moorum below. The pit-work has revealed a state of affairs favourable beyond all anticipation. At about 1 mile 1 furlong, the channel falls into Perur small tank, the F.T.L. of which I propose to raise 3 feet and to remodel the bund and weirs. At 5 miles and 1½ furlongs, the canal falls into Konetinayanapalyam tank. Here I propose to raise the F.T.L. about 7 feet and to remodel the tank. Near Maddulacheruvu, I propose to cross a small valley with a bank about 20 feet high, and 1 furlong in length, thereby saving a detour of over a mile, and thus forming another small tank. This is about the largest work on the line. It is here that a tiny patch of wet cultivation would be interfered with, the only piece of its kind on the canal.

The area I have proposed to supply with water is 32,400 acres. A great deal more land is commanded than can be supplied or than there is population to cultivate. It would possibly require the assistance of the Revenue Department to decide how best to arrange the ayacut. The method of distribution advocated (*vide* report) is to first supply the existing tank ayacuts by giving each tank which can be reached just that supplemental supply required. The following are the tanks which would be benefited:—(1) Perur large tank, (2) Perur small tank, (3) Konetinayanipalayam, (4) Mutimadugu, (5) Bhadrapuram, (6) Tagarakunta big tank, (7) Bukkacherla (by a branch from the anicut channel), (8) Brahmanayaleru, (9) Kamaripalli, (10) Aalamur, (11) Kakkalapalle, (12) Kattiganikalva, (13) Raptadu (this has already a supply channel from the Pandameru, (14) Anantapur big tank, (15) Singanamalla tank—in all fifteen good tanks.

Nearly all these tanks have recently been thoroughly repaired under tank restoration estimates. They are consequently in good order, and the only thing they apparently need is water. I have recently inspected nearly all of them. Singanamalla alone had a supply and the rest, including Anantapur tank, were absolutely dry and had been.

The balance of the water I propose to spend by direct irrigation under the canals. It must be understood that the areas tinted green in the map are those within which existing ayacuts will be protected by supplemental supplies and new cultivation developed. The green area does not represent exactly the 32,400 acres which I estimate can be supplied but rather the gross area commanded.

My first rough estimate of the cost of the scheme is as follows. Nearer approximations to actual cost will accompany the Preliminary Report:—

Description of work.	Appoximate estimate amount.
	RS.
Main dam across the Pennér	20,00,000
Surplus weir cutting...	4,50,000
Three head sluices at the reservoir (all built into the main dam, one main and two very small)	20,000
Main canals on right and left sides of Pennér	1,50,000
Palcherla anicut	2,500
The anicut channel to Brahmanayeleru	38,000
Distributaries...	60,000
Total, Works ...	27,20,500
Establishment, 23 per cent. on "Works"	6,25,715
Tools and Plant, 1½ per cent. on "Works"	40,807
Land compensation	10,000
Grand total, Direct charges ...	33,97,022
Capitalized abatement of land revenue at 1¼ times the amount provided for land compensation	12,500
Leave and pension allowance at 14 per cent.	87,600
Total, Direct and Indirect charges ...	34,97,122

Returns.

32,400 acres at 4 rupees per acre	1,29,600
Deduct—	
Working expenses for 20,000 acres at 8 annas per acre	10,000
Collection charges at 5 per cent. on the water-rate	6,480
	16,480
Net return ...	1,13,120

Equivalent to 3·23 per cent. on total of Direct and Indirect charges.

Note.—Enhanced land revenue due to irrigation and the sale value of unassigned lands not added.
Present assessment—
Dharmavaram—50 per cent. at 4 annas and 32 per cent. at 2 annas.
Kalyandurg—43 per cent. at 4 annas and 45 per cent. at 2 annas.

It is probable that the percentage return will be slightly raised in the report after more consideration is given.

It must of course be understood that the estimate is a first rough one. What is proposed in the case of each of the main works connected with the scheme is being roughly sketched out, the quantities are being taken out, so that estimates rather closer to actual cost will be shortly submitted.

The following points require note :—

(1) A large portion of the water is supplied to lands already terraced and served with distributaries and provided for by existing working expenses so that that item may on further consideration be reduced.

(2) Regarding land compensation it will be next to nothing for so large a scheme. The lands submerged is almost entirely dry and is cultivated once in three years. The ryots will not take it on patta and it is under sivayajamma.

(3) Establishment is already provided for the collection of revenue from a percentage of the ayacut.

A large percentage of the work is suitable for famine labour.

The return is quite as high as ought reasonably to be expected. If it were much less it would still seem ample in the case of such an area. I suppose absolutely the most poverty-stricken region of the poorest district of this Presidency. Remission of revenue is nearly as frequent as collection.

With reference to the note by the Chief Engineer for Irrigation on the Preliminary Report on the Papaghni Reservoir Project that (*a*) the scheme gave a return of "only two per cent." and (*b*) the water was needed for the Someswaram Reservoir, the present project may on fuller consideration give a return of nearly double the previous one and, regarding the water, is quite an open question as to how much of that here impounded would have reached Someswaram.

II

Letter—from H. E. CLERK, Esq., Superintending Engineer on Special duty.
To—the Chief Engineer for Irrigation.
Dated—Madras, the 20th February 1906.
No.—402.

In continuation of this office No. 340, dated 13th February 1906, forwarding a brief report on the Upper Pennér Reservoir Project, I have the honour to enclose a letter from Mr. Milner giving the data on which he fixes the amount of water available for storage at 7,000 millions cubic feet. In doing so, I append the following remarks :—

(1) Mr. Milner in his paragraph 3 has calculated the total rainfall on the catchment area and has taken one-seventh of the amount as the run off. It is possible to get a nearer approximation by allowing different percentages of run off according to the amount of the rainfall on the various compartments. I have deducted 2 to $2\frac{1}{2}$ inches from the total average annual rainfall and have applied the percentages given in appendix VI of Strange's reservoirs for an average catchment. The result is 15,036 millions cubic feet against 16,116 millions cubic feet calculated by Mr. Milner.

(2) The duty per square mile alluded to in Mr. Milner's paragraph 6 appears to be very high. I happen to have a fairly intimate knowledge of the conditions of tank cultivation in Hindupur and Madakasíra taluks and therefore know that this high duty is mainly owing to the custom of growing dry crops under the tanks in the early part of the year. If they subsequently fill, a rice crop is grown, otherwise more dry crops are planted. In the accounts no accurate distinction is made, but this accounts for the very large ayacuts under the tanks in this area. It is probable that for rice a duty of about 15 acres per square mile would be about what could be obtained. A good deal of importance must, however, be attached to the fact that in chains of tanks the water is used over and over again.

(3) It is very unfortunate that the gauging of the Pennér have not been more systematically kept. They show, however, that in an average year there will be plenty of water. I am afraid that in years of moderately deficient rainfall the area of cultivation will have to be curtailed to some extent, and in a really bad year there is likelihood of a failure over the greater part of the area. This is the only real defect in an otherwise excellent project. I am none the less strongly in favour of carrying it out. The conditions of the Anantapur valley are such that water is necessary in almost all years and although an occasional failure is much to be deplored, the net benefit to the country would be immense.

Enclosures.

Catchment basin of the proposed Upper Pennér Reservoir.

Centres of rainfall areas.	Average annual total quantity of rainfall.	Percentage to be taken on column 2.	Percentage in column 3 expressed in millions-cubic feet.
Hoshote	2,935,617,823	10	293·56
Pavagada	12,563,122,176	9	1,130·68
Penukonda..	9,125,024,072	12.	1,095·00
Madakasíra	13,504,557,158	13	1,755·59
Hindupur	13,205,667,389	15	2,280·85
Bagenhalli..	481,976,648	9	43·38
Maddagiri	8,851,046,308	10	885·10
Goribidnur	15,795,399,629	14	2,211·35
Gudibanda..	6,185,819,228	17	1,051·59
Koratagiri	13,126,656,154	11	1,443·93
Tumkur	3,290,528,440	23	756·82
Nelamangala	519,564,165	15	77·93
Dodballapur	6,139,634,012	17	1,043·74
Chikballapur	5,091,878,246	19	967·46
Total ..	....	..	15,036·98 millions of cubic feet.

Letter—from H. W. Milner, Esq., Assistant Engineer, Cuddapah-Anantapur Investigation Party.

To—the Superintending Engineer on Special duty.

Dated—Madanapalle, the 15th February 1905.

No.—215.

With reference to your No. 336, dated the 12th instant, I have the honour to forward a skeleton summary of the data called for with regard to the water available for the proposed Upper Pennér Reservoir. The matter is of course of vital importance, and I have dealt with it rather fully in the report which I hope to submit next week.

2. The area of the catchment basin is 2,025 square miles. By a simple geometrical construction, I have subdivided this area into fourteen small areas, each connected with a rain station, in such a manner that every point within one such small area is nearer to the particular rain station to which the area is attached than to any other rain station. These small areas I have then multiplied by the average rainfall at the station connected, and so obtain the total quantity of water which falls upon the basin in an average year. In tabular form this is as follows.

3.

Rainfall areas.	Areas in square miles.	Average annual rainfall in inches.	Years on which average is taken.	Average annual total quantity of water which falls on each "rain area."
Hoshote	59·52	21·23	6	2,935,617,823
Pavagada	275·20	19·65	34	12,563,122,176
Penukonda	164·48	23·88	36	9,125,024,072
Madakasira	240·80	24·14	36	13,501,557,158
Hindupur	285·44	27·93	36	15,205,667,389
Bagenhalli	10·24	20·26	34	481,976,648
Maddagiri	177·12	21·51	34	8,851,046,308
Goribidnur	271·20	25·07	34	15,795,399,629
Gudibanda	89·44	29·77	34	6,185,819,228
Koratagiri	248·80	22·71	34	13,126,656,154
Tumkur	37·76	37·51	34	3,290,528,440
Nelamangala	8·32	26·88	34	519,564,165
Dodballapur	89·92	29·39	34	6,139,634,012
Chikballapur	66·72	32·85	34	5,091,878,246
Total ..	2,025·00	..	..	112,816,491,448

4. It will thus be seen that the total quantity of water which falls upon the basin in an average is 112,816·5 millions of cubic feet. The figure may, I think, be accepted confidently.

5. Assuming a run off of 1/7, which seems a thoroughly safe figure, we get 16,116·6 millions of cubic feet as the water which would run off if it could in an average year.

6. The existing wet cultivation in the British portion of the catchment basin is as follows :—

	ACS.
In Hindupur	11,793 78
,, Penukonda	8,256·62
,, Madakasira	4,846·35
,, Dharmavaram	58·77
Total ...	24,955·52

or say 24,956 acres. This is equivalent to nominal duty of 40·1 acres per square mile of British Territory. The true actual duty is not so easy to obtain, as British sources have their catchment in Mysore, and some small Mysore sources in British Territory.

7. The figure given by Mysore Engineers for the cultivation in the 1,402·7 square miles in that state is 86,000 acres. This is surely an error, as it is equivalent to nominal duty of 61·3 acres per square mile of Mysore Territory and tanks are neither so numerous nor so large in the mountainous Mysore portions of basin as in the more open British portions. Taking a "nominal duty" in Mysore also of 40·1, the total cultivation in the whole basin is 81,204 acres. I believe this figure is high and a further reference to Mysore is necessary, sending a map of the basin.

8. This area is made up of an immense number of little areas. The tanks are situated in minor basins one above the other and isolated tanks are rare. Considering an area of an acre at the top of a minor catchment, I have allowed 216,000 cubic feet of water during the cultivation season. In wastage and leakage, in changing the water during cultivation and in draining the land before the harvest, I have assumed that half the allowance passes down to the next small tank, where it is used a second time. Half of this again passes to the next below, and half again to the tank below that. We thus get, as served by the original allowance of water, a series of areas forming a decreasing geometrical progression, the sum of which in the limit is 2 acres. Calculating by this method, 8,770 millions of cubic feet are needed for existing cultivation, and this leaves a balance of 7,346·6 millions of cubic feet for the new reservoir (see note by Inspector-General of Irrigation, paragraph 8 in G.O., No. 26 I, dated 8th January 1906).

9. The second method of estimating is completely independent of the former. Discharges in the Pennér were gauged in 1868, 1869, 1901, 1902 and last three months of 1905. Those of 1868 were made near Hindupur, above the junction of the Jayammangali and cannot enter into comparisons ; 1905, too, has to be excluded. The 1901 and 1902 readings were taken on same gauge and those of 1869 appear to have been taken near the same place. Readings for 1901 started in August, and I think some water has been allowed to pass down unmeasured. The

discharges for these three years are shown in conjunction with the rainfall which produced them in tabular form below.

10.

Station.		Hoskote.	Pavagada.	Penukonda.	Madakasira.	Hindupur.	Bagenhalli.	Maddagiri.	Goribidnur.	Gudibanda.
1		2	3	4	5	6	7	8	9	10
Rainfall in inches.	1869 ..	..	..	..	..	..	..	..	..	..
	1901 ..	17·85	16·47	23·04	18·81	18·97	22·06	31·75	26·52	26·06
Rainfall in inches.	1902 ..	19·66	19·29	20·70	24·43	28·01	27·93	28·91	28·68	37·68
	Average ..	21·23	19·65	23·88	24·14	22·93	20·26	21·51	25·07	29·77
	Total ..	18·69	19·12	23·88	24·14	22·93	19·60	21·20	24·52	28·96

Station.		Koratagiri.	Tumkur.	Nelamangala.	Dodballapur.	Chikballapur.	Average of 14 stations.	Discharge of Penner at Perur in millions of cubic feet.	—
		11	12	13	14	15	16	17	18
Rainfall in inches.	1869 ..	..	..	..	..	..	Not available.	14,089·047	Whole year.
	1901 ..	29·07	36·27	25·76	38·25	35·76	26·19 (average of 14 stations for 1901).	8,745·169	August 19th to December 31st.
Rainfall in inches.	1902 ..	25·04	36·12	27·31	30·66	46·05	28·60 (average of 14 stations for 1902).	14,079·590	Whole year.
	Average ..	22·71	37·51	26·88	29·39	32·85	Average for 34 years.	..	..
	Total ..	22·26	33·59	26·09	28·69	32·08	Average for 33 years.	..	..

11. It will be observed that in 1901 the annual rain returns for six of the northern stations nearest the Perur gauge (together with Nelamangala) were below average, whilst the seven southern stations were a little above average. In 1902, excluding Penukonda, all records were slightly above average.

12. We are able to apply at this point a useful check. Taking the fourteen areas given in paragraph 3, and multiplying each by actual rainfall at its particular station for both 1901 and 1902 instead of by the average rainfall, we get for the total water falling on the whole basin in those two years 114,634·04 and 125,375·08 millions of cubic feet. Taking in each case $\frac{1}{7}$, we get 16,376·29 and 17,910·72 millions of cubic feet. Allowing in both cases 8,770 millions of cubic feet for existing wet crop, we get available for the reservoir 7,606·29 and 9,140·72 millions of cubic feet respectively. Actual discharges at Perur were 8,745·169 (August to December) and 14,079·590 millions of cubic feet.

13. After carefully weighing all the results, I have adopted 7,000 millions of cubic feet as available in all years but worst.

III

Memo. No. 716, dated 27th February 1906.

The Chief Engineer for Irrigation has the honour to observe that there would seem to be sufficient reason for concluding, as does the Special Superintending Engineer himself, that the complete investigation of such a project as that of the

Upper Penner project need not be deferred on the ground that it would interfere with the supply to the Tungabhadra project. Taken by itself, the Upper Penner project would of course be a useful famine protective work. A statement of surplus discharges at Adinimayapalli anicut is herewith attached. This shows failure in four years out of the past ten which cannot be described as "Occasional failure". Before formal orders for the complete investigation can be passed, the Chief Engineer would request the Superintending Engineer to be so good as to consider whether better results could not be made out with a smaller project.

F. J. Wilson,
Chief Engineer for Irrigation.

To the Superintending Engineer on special duty.

IV

Letter—from H. E. Clerk, Esq., Superintending Engineer on special duty.
To—the Chief Engineer for Irrigation.
Dated—Madras, the 2nd March 1906.
No.—481.

With reference to your Memorandum No. 716, dated 27th February 1906, I have the honour to acknowledge the receipt of the statement of surplus discharges at the Adinimayapalli anicut, and to state that I am not quite sure in what way the statement shows "failure" of the Upper Penner system.

2. The total catchment area of the Penner at the site of the proposed reservoir is 2,025 square miles, while that of the same river at the Adinimayapalli anicut is 13,316. It is apparently assumed that the run-off per square mile of catchment is the same throughout and that the proposed storage being 7,000 millions cubic feet, failure will take place whenever the surplus at the Adinimayapalli anicut falls below 42,000 millions cubic feet.

3. With regard to this I would point out that the last ten years have comprised an exceptionally high proportion of years in which the rainfall has fallen markedly below the average. This is exhibited in the following table for a few rain-gauge stations in the area of the Penner catchment:—

Name of station.	Average rain-fall.	Amount taken as "failure".	Number of failures in 1896 to 1905 (10 years).	Number of failures in 1870 to 1895 26 years).
Madakasira	24·14	21	5	8
Hindupur	22·93	19	5	6
Penukonda	23·88	21	4	7
Dharmavaram	20	17	6	7

4. I have, since writing my previous letters on the subject, received a longer report from the officer in charge of the party, and a further consideration of the figures he gives enables me to make some rough estimate of the extent to which the project will fail in years of deficient rainfall. As above stated, the catchment area of the Penner at the proposed reservoir is 2,025 square miles. Of this, 1,403 square miles are in Mysore and 622 in British territory. The area in Mysore is so well served with tanks which are kept in such a state of efficiency that we may consider that when the rainfall is below the average there will be no supply coming in from Mysore. This assumption is in accordance with local experience and with (I believe) the opinion of Mysore Engineers. We can therefore eliminate all consideration of the area in Mysore.

The catchment area in British territory is 622 square miles and it has within it 25,000 acres of wet cultivation. It is, however, to be noted that in such years as we are considering the great bulk, probably three-fourths of the cultivation, is ragi, cumbu

and korra. I have elsewhere shown that for a single crop of ragi 36,300 cubic feet are required, or, adding 25 per cent. for losses in evaporation, etc., we may say in round numbers 45,400 cubic feet are required. On the above assumption of the proportion of crop irrigated we have then —

		Millions cubic feet.
6,250 acres at 216,000 cubic feet	... ...	1,350
18,750 „ at 45,400 „	... ...	851
	Total ...	2,201

or say 2,200 millions cubic feet are required for existing cultivation.

5. The rainfall in the British catchment of the Penner is best represented by a mean between Hindupur and Madakasira which may be taken as 23·5 inches on an average.

The area to be irrigated by the project may be either entirely rice or partly rice and partly some other crop. The latter arrangement would be in my opinion in every way best, and I would put it down as one-third rice and two-thirds " dry crops, " but to allow for the great length of canal I would increase the quantity required for the latter from 45,400 cubic feet to 50,000 cubic feet. The average requirements of the project per acre would then be 105,333 cubic feet, but, to make extra allowance, we will put it at 110,000 cubic feet per acre. We can now make out a table of areas cultivable for any rainfall, using the percentage of run-off worked out by Mr. Binnie (see appendix II, Strange's reservoirs). I have deducted 2 inches to make the rainfall correspond with the monsoon rainfall of Mr. Binnie. I have included the May rainfall as it is in some years very heavy and the average for the month is greater than that in June, July, November and December.

I have taken the catchment as a good one rather because of the distribution of the rainfall than because the catchment is good. The rain, especially in bad years, is liable to fall in heavy showers (*vide* rainfall statistics), and for this the tables I use make no allowance.

Rainfall.		Percentage of run-off to rainfall in column 2.	Yield of run-off from square mile of catchment mills. c. feet.	Total yield of run-off from 622 square miles.	Amount available for storage, column 5 *minus* 2,201 mills. c. feet.	Area irrigable at 110,000 c. ft per acre.
Total.	Reduced.					
1	2	3	4	5	6	7
22	20	15·0	6·970	4,335	2,134	19,400
21	19	13·9	6·135	3,816	1,615	14,680
20	18	12·8	5·353	3,330	1,128	10,264
19	17	11·6	4·581	2,849	648	5,890
18	16	10·5	3·903	2,428	226	2,055
17	15	9·4	3·276	2,038	..	..
16	14	8·3	2·699	1,679	..	..
15	13	7·2	2 174	1,352	..	..
14	12	6·2	1·728	1,075	..	..
13	11	5·2	1·329	827	..	..
12	10	4·3	0·999	621	..	..
11	9	3·5	0·732	455	..	..
10	8	2·8	0·520	323	..	..
9	7	2·1	0·341	212	..	..
8	6	1·5	0·209	130	..	..
7	5	1·0	0·116	72	..	..
6	4	0·7	0·065	40	..	..
5	3	0·4	0·028	17	..	..
4	2	0·2	0·009	16	..	..
3	1	0·1	0·002	1	..	..
2	..	..	..	..	..	..
1	..	..	..	..	..	..

6. Taking a mean of the rainfalls at Madakasira and Hindupur for the last ten years, it appears that in seven years they fall below the average as follows :—

		Acres irrigable.
1896	18·4	4,000
1898	22·4	20,000
1899	17·6	1,000
1900	20.59	12,000
1901	18·89	5,000
1904	19·59	8,000
1905	20·33	11,000

That is to say, there would have been almost total failure in 1899 and in the other years only the acreage shown in column 3 would have been cultivated. This calculation, which I am afraid is not unduly hard on the project, makes me inclined to modify my previous opinion, especially as the estimates which have now been received are considerably higher than I was led to expect, and even these seem to me to err on the low side.

7. A rate of Rs. 1–12–0 per 1,000 cubic feet for carting and consolidating previously-excavated earth for the main dam including as it appears the cost of trucks, etc., is ridiculous. I would increase it to Rs. 7. The provision for baling and unforeseen items is insufficient. For these, I would add Rs. 50,000. The allowance for compensation is, I am sure, too small and I mistrust the allowances made for distributaries, etc., though I am not in a position to say where they fail. For these reasons I would add at least 5 lakhs on to the estimate as now submitted and I think that Rs. 45 lakhs is too high a price to pay for such moderate protection as this project would afford. I must, therefore, reluctantly withdraw the recommendation that the project should be fully investigated in its present form.

8. As far as I know, the only alternative is an anicut somewhere near the present site. This would get rid of the very expensive reservoir, but it would not be so efficient, as we could not hope to store the whole flow in the river. Any project at this point is bound to be expensive on account of the long channel necessary to lead the water into the Anantapur valley where alone any extensive ayacut can be obtained.

9. I do not think it necessary to send you the plans and estimates which I have received until I hear further from Mr. Milner on this point. In the meanwhile the proposal may lie over.

V

Memorandum No. 2525, dated 16th July 1906.

The attention of the Superintending Engineer on special duty is invited to the correspondence ending with his letter No. 481, dated 2nd March 1906, and he is requested to be so good as to report whether any communication has since been received from the officer in charge of the Cuddapah-Anantapur Investigation Party regarding the prospects of a project on the Upper Penner smaller than the one first proposed. If not, it is requested that the necessary investigation may be expedited and the results reported at an early date.

(By Order.)

T. W. S. SMYTH,
Asst. Chief Engineer for Irrigation.

To the Superintending Engineer on special duty.

VI

Inspection Notes of H. E. Clerk, Esq., Superintending Engineer on Special duty.

Upper Penner Reservoir Project.

22*nd June to* 1*st July* 1906—*Available supply.*—This project, as originally submitted by Mr. Milner, was dealt with in my letter No. 481, dated 2nd March 1906, to the Chief Engineer for Irrigation. Mr. Milner has now submitted a modified preliminary report, in which the question of the expected discharge of the Penner is gone into in great detail.

I also, when passing through Bangalore, made some enquiries as to what the Mysore Engineers were doing and what their opinion as to the surpluses available in average years would be. A special officer has lately been employed in investigating this basin and working out what can be done tank by tank. He showed me his method of working which was very interesting, but I do not agree with a good deal of his assumptions and as his calculations were based entirely on these assumptions I do not think they are of much use to us. I believe that in average years we shall get some discharge from the Penner in Mysore, but the moment the rainfall falls below the average, that supply will dwindle away to almost nothing. It would, therefore, be safer to neglect it as a source of supply. Mr. Milner, in table 24-C, has been at much pains to work out the quantities of water available from the catchment in British territory. The only objection I have to this is, I think, that I attached too much importance to the distribution of the rainfall and not enough to the nature of the catchment when, in my letter No. 481, I classed it as good. There are, certainly, rocky hills, but there is a very large area of very porous gravels and sandy soils. I would therefore class the catchment as average. Taking the average monsoon rainfall as 22 inches for Hindupur, Madakasíra, Penukonda and Pavagada, the run-off in inches would be 2·854, and this from an area of 925 square miles would be 6,124 millions cubic feet. From this has to be deducted the amount of water required for existing wet which is worked out by Mr. Milner to be 2,879 millions cubic feet. The balance from British territory is, therefore, 3,245 millions cubic feet. The total amount available in an average year may therefore be said to be 3,245, *plus* an indeterminate supply from Mysore. Mr. Milner has prepared an estimate for a reservoir of 3,000 millions cubic feet and this is a suitable size for the supply in ordinary years. If necessary, extra storage may be provided in the tanks in the Anantapur basin.

2. *Site and design of bund.*—The site as regards length of bund and capacity is a favourable one. The nature of the soil is, however, very unsuitable for an earthen bund. In the first place, the soil on which the bund rests is gravelly on the surface, changing to a grey morum or in places a yellow morum, both probably rather porous. This formation goes unexpectedly deep as there are outcrops of rock in every direction and one would expect to meet it in a very solid form within a few feet of the surface. Some pits, however, have been sunk to considerable depths quite close to these rocky "kopjes" and in one place a depth of 20′ has been reached without meeting rock. The whole of the country in this neighbourhood has this character and it is easily imagined that it would be almost impossible to get enough suitable earth with which to form an earthen bund capable of holding up a maximum depth of nearly 70 feet of water. The only possible form of earthen bund would be one with a masonry core reaching up to F.T.L., the front portion of the bund being formed of carefully selected material and the rear of gravel, morum, etc., with a massive dry stone toe, there being large quantities of boulders available within a quarter of a mile of the river crossing. I have been at some trouble to ascertain what earth, there, is suitable for the purpose of the front of the bund. About 10,000 units are required and I have satisfied myself that this amount could just about be obtained with an average lead of 6 furlongs, but even then some of the earth is a stiff black clay used for covering the flat-topped houses of the Deccan and this would have to be mixed with grit of some sort to be suitable. A mixture of one-third of the grey morum would make a most excellent bund but would add largely to its cost. This, I believe, to be the only section possible at the site.

3. *Surplus arrangements.*—These are very difficult and I have spent some time considering what is best to be done. The flood discharge for 2,025 square miles with a co-efficient of 500 in Ryve's formula is 79,370, and 80,000 cusecs has been assumed by Mr. Milner to be a maximum. This would doubtless be the case were it not that the whole basin is studded with innumerable tanks some of which are certain to breach in years of very heavy rainfall. No attempt had been made to ascertain the maximum discharge of the river from flood marks; but at Perur village the flood mark in 1903 is well known and was pointed out independently by several villagers. The discharge of the river at this level should be calculated. This flood is not a maximum but it is an exceptionally high one and will be of great use to us in fixing the maximum. In the meantime I accept provisionally Mr. Milner's estimate

of 80,000 cusecs. The ridge selected for the weir varies from between 4 and $7\frac{1}{2}$ feet below F.T.L. The ground in rear has a fall of about 25 feet in 800 to the bottom of the stream, which it joins. This ground, although apparently rocky, consists of gravel and morum with boulders to a depth of (probably) about 17 or 18 feet. The pits dug on the line of the surplus weir are not nearly deep enough. One pit was deepened while I was there and rock was met with at 14 feet below the surface. This surplus weir will be in very constant use as, in all years the least bit above the normal, there will be a considerable flow over it. It must, therefore, be made absolutely safe. After much consideration I have decided that the best plan is to construct a masonry body wall let 3 feet into the sound rock and leave the whole of the ground below to scour away. When the rock has been laid bare, it will probably be found necessary to build cushion walls in places to protect the softer portions of the rock. The maximum overfall is likely to be about 24 feet. I considered the possibility of surplussing at the right flank but it would be impossible to get the necessary length there, besides the consideration that a bridge would be required to get at the bund and that the surplus would have to cross the irrigation channel.

4. *Cost of reservoir.*—I have had a rough estimate made on these lines for the above works. I may explain that I have allowed for the earth being carried in trucks and therefore have reduced the ordinary allowance for lead by one-fourth. I have, however, allowed Rs. 2 per unit for consolidation instead of the usual allowance of 9 annas 6 pies.

It is to be remembered that the site of the work is in an out of the way place and there is practically no local labour or supplies or fodder available. All labour will have to be imported, hutted and fed. While, if bullocks are used, fodder for them would have to be imported.

5. *Main canal.*—The line of the main canal is 15 miles long. It has been very carefully laid out by Mr. Milner and after inspecting it very thoroughly I have no doubt that the best line has been adopted. If the branch channel to Bhadrapuram tank is abandoned the line may be slightly modified at the end as suggested on the spot. If the project is completely investigated the cross drainage must be accurately taken out and provided for. Various minor modifications are required, *e.g.*, Perur small tank bund carries a village road and when it is raised will have to be made at least 12 feet wide. Some of the crossings of depressions will be rather expensive, as there is not earth available suitable for holding up as much as 13 feet of water. In these cases, a masonry front wall will have to be built to prevent percolation. The co-efficient $N = \cdot 02$ in Kutter's formula, gives rather too big a discharge for canals of this sort. $N = \cdot 0225$ is safer, and I almost doubt if $\cdot 025$ would give too big a discharge. I may here allude to the proper section for the canal. Mr. Milner has not shown how he arrived at it, but he has taken the total quantity of water required for a crop and assumed it discharged regularly at the same pace throughout the season. This is not the case and it is a little difficult under old methods to say what will be the greatest demand on the canal. I will here work out what it will be though I anticipate somewhat the results arrived at in paragraph 11 below. The maximum demand on the canal will be 16 inches in a month with no rainfall to assist it. For this, the discharge at the head, allowing for 25 per cent. loss, will have to be 1·77. The area to be supplied being 10,000 acres, the required discharge per second is—

$$\frac{1{\cdot}77 \times 10{,}000}{30 \times 2} = 295.$$

This discharge is a little less than that required by Mr. Milner but I have not thought necessary to alter his estimates. There are 3 or 4 cuttings 18 feet deep and one 36 feet deep which will be expensive, but they cannot be avoided.

6. *Loss by evaporation and absorption.*—The irrigation season will, in a normal year, last from September to February. In some years it might be possible to begin cultivation a little earlier but it is not probable that there will be any water to speak of before the end of August. The air is dry especially in January and February. We may, making allowance for rainfall on the reservoir itself, count on a loss of 4 inches per mensem for six months, *i.e.*, 2 feet. The area of the reservoir when half full *i.e.*, at + 115, is 85·5 millions square feet and the total loss by evaporation will be

171 millions cubic feet. Considering the fact, however, that the reservoir is not large enough to hold the normal run-off and will probably fill $1\frac{1}{4}$ times, I would neglect this loss and assume that we have the reservoir once full to deal with.

7. *Loss in the main canal.*—This is bound to be considerable. The canal passes throughout its length through gravels and soft morum and this will form the material of which the banks have to be made. I would take the loss at 8 cusecs per million square feet of wetted perimeter. Taking the section given by Mr. Milner the wetted perimeter is 29·18 feet and the length is 15 miles. This gives a loss of 18·48 cusecs or 7·5 per cent. of the discharge of 244 cusecs. The loss from evaporation from the various small tanks would amount to 3 or 4 cusecs for five months and may be neglected.

8. The rates entered by Mr. Milner in his preliminary estimate are entirely inadequate and I have corrected them. After allowing for contingencies and petty supervision, the preliminary estimate is raised from $8\frac{1}{2}$ to $19\frac{1}{2}$ lakhs. A very large portion of this increase is due to the alteration in the design of the dam, but apart from this there are mistakes in rates which an intelligent use of the schedule and consultation with his more experienced subordinates would have obviated.

The following is an abstract of it, as modified by me :—

Estimate.

	RS.
Main dam across the Pennér	8,23,550
Surplus weir	1,38,251
Head sluice from reservoir	12,000
Main canal excluding tanks	97,707
Remodelling Perur small tank	10,000
" Konetipalayam tank	35,226
Miscellaneous masonry works on main canal	1,50,000
Total for reservoir and main canal	11,66,734
Improvements to Togarakunta tank	5,000
Palcherla anicut and head sluice	8,000
Canals from Palcherla anicut	30,000
Masonry works on Palcherla anicut	8,000
Distributaries for 12,000 acres at Rs. 5	60,000
Land compensation	75,000
Buildings and huts for work men	20,000
Contingencies at 5 per cent.	68,635
Petty supervision at $2\frac{1}{2}$ per cent.	34,318
Total	14,75,687
Land compensation	75,000
Establishment at 23 per cent. on works	3,15,721
Tools and Plant at $1\frac{1}{2}$ per cent.	20,590
Total	18,86,998
Leave and pension allowance at 14 per cent. on establishment	44,198
Grand total	19,31,196

9. The water, after crossing the watershed, flows by natural courses to Togarakunta tank. This is a small minor tank irrigating only a few acres. I do not think it advisable to enlarge it, but it might be possible to get a good deal of extra irrigation under it. According to Mr. Milner's proposals the water will leave the tank by a weir and enter the Palcherla vanka, a tributary of the Pandameru which falls into Anantapur tank. About 4 miles down the stream just below Palcherla it is proposed

to take off a contour channel which, after running for 9 miles passing *en route* above the foreshore of Bukkacherla tank, falls into the Bramanaleru tank. The channel throughout its course passes through lands of the poorest description. They are light sandy soils with a moderate transverse slope, through which the percolation would be very great. They are assessed, I believe, at from 2 to 6 annas per acre and are occasionally cultivated with grain crops and castor early in the year and with gram in November. The soils on the margins of the streams are generally more alluvial, but they are to a great extent impregnated with *soudu.* This appears to be the character of the whole country that the project could command. Under the tanks and wells the soil is somewhat better owing to manuring and under the tanks, no doubt, to the deposition of silt.

10. Before going further, it will be well to make a rough estimate of the duties which may be hoped for from this project :—

Estimate of duty.

Losses in transit.—I would put these as follows :—

		PER CENT.
(1)	Losses in main canal	7·5
(2)	,, in river bed lower canal and distributaries	7·5
(3)	,, in field channels	10·0
		25·0

(This is for rice cultivation.)

Amount of water required.—In writing of the Bhaváni project I took 4·25 feet as the total amount of water required on the fields for a five months' crop. Here the soil is much more porous and poorer and I should estimate that it would require quite 30 per cent. more. Some of the land is rather steep and what is not, *i.e.*, at the bottom of valley, has a good deal of salt in it. I would therefore put the total requirements on the field at 4·25 + 1·41 = 5·66 feet.

Rainfall in catchment.—The rain-gauge station at Anantapur may be taken as typical of rainfall in the ayacut. During the cultivation season the average rain fall is as follows :—

	INCHES.
September	5·19
October	4·44
November	1·40
December	·13
	11·16
Deduct—$\frac{1}{7}$ for run-off	1·59
Utilizable balance	9·57
	= ·79 feet.

I have taken all the rainfall, because only once in 36 years has the rainfall exceeded 12 inches in any month and because by arranging out channels that they surplus into tanks, we can utilize any surplus water in our channels by extending irrigation under the existing tanks, which will also utilize the field drainage.

The total amount of water to be supplied by the canal is therefore 5·66 — ·79 = 4·87 feet. This, allowing for a loss of 25 per cent., is equivalent to 6·08, or, say, 6 acre-feet delivered at the head sluice. Taking the cultivation season as 156 days, we have duty = $\frac{156 \times 24 \times 60 \times 60}{6 \times 43,560}$ = 51 or say 50. We have now to consider how much of this can be used again. The loss on the main canal is absolute loss and that in the river bed and distributaries is mostly loss. I would therefore say that 10 per cent. is lost absolutely. We have therefore 6·00 — 0·6 = 5·4 feet to deal with. Of this I would estimate that $\frac{1}{4}$ can be used again. We can therefore hope that for each acre of new wet cultivation we can impound a supply = $\frac{5\cdot4}{4}$ = 1·35 feet over an acre or 58,791 cubic feet.

No. 1060 I., 6TH OCTOBER, 1906.

Assuming the project to be an entirely wet crop one, and the reservoir to fill once including all loss for evaporation, we would be able to have $\frac{3,000 \text{ millions}}{261,360} = 11,480$, say 11,500 acres of single crop, and the drainage from that would amount to 676 miles, or enough at 4 acres per million for 2,704 acres of extension of irrigation under existing works. This, I think, is a somewhat favourable estimate of the duty we are likely to get and it would be safer to fix it at 45. In which case the area irrigabie would be 10,000 + 2,350, say 12,000 acres.

11. *Duty for dry crops.*—The only season in which we could economically give water for dry crops is September, October, November and December. In ordinary soils water would be required thus:—

	FT.	IN.
September	0	6
October	0	4
November	0	4
December	0	4
	1	6

but in the very light soils we would have to irrigate on this project the crops would require water instead of once every ten days, say, once every seven, *i.e.*, an excess of 43 per cent. will be required, and the total depth including rainfall will be 2·14 feet. I have taken the average rainfall at Anantapur for 36 years. I have excluded five years when the project would have failed and I have never allowed more than 4 inches in any month. These averages are—

	INCHES.
September..	3·12
October	3·08
November	1·44
Total ..	7·64

From this I would deduct 7 per cent. for run-off. This gives a utilizable depth of rainfall during the cultivating season of 7·14 inches or ·59 foot, and the total depth of water to be supplied from the reservoir is 2·14 — ·59 = 1·55 feet per acre. The losses will be as follows for the main canal as before, but as the distributaries will be a good deal longer we may increase this loss from 7·5 to 10·5. The losses in the field channels would, I fear, be very great, more than double the losses in the case of rice, and I would put them at 22 per cent. This gives a total loss of 40 per cent. and the required discharge at the head would be 2·17 acre feet. This would have to be discharged in 122 days and the duty would be $\frac{122 \times 24 \times 60 \times 60}{2\cdot17 \times 43,560} = 112$ duty.

The total quantity required per acre would be 43,560 × 2·17 = 94,525, say 94,500, and the reservoir once full could irrigate over 31,000 acres. This is, I think, a somewhat favourable estimate of what the reservoir could do in the matter of dry crops, and I would be inclined to increase the quantity of water required per acre to 100,000 in which case the duty would be 105 instead of 115 and the area irrigable 30,000 acres.

12. This project is one which depends very much on the revenue and agricultural side of the question, and it is a great pity that the Revenue officers were not more regularly and formally consulted throughout the investigations which have now been going on for many months. We can no doubt turn into the Anantapur valley at the cost of something like 19 lakhs about 2,700 millions cubic feet of water. The question is how can this be utilized most profitably to the ryots and State. The area supplied is famine affected in a high degree and water is badly needed, but on the other hand the population is scanty. The soils are very light and poor and there is, as far as I can see, an almost total absence of manure beyond what is now used. The wet rates in vogue are very low and it is doubtful if, with the poor unmanured land, a higher water-rate could be demanded.

13. Another difficult question is the system of cultivation. It is the habit in these parts to say that there are two seasons for starting rice cultivation. Kartigam in June-July, when a five months' crop can be grown, and Vaishakham in December-January when a short crop is started. Any time between these two is considered unsuitable for growing paddy and if the tanks fill, the water is allowed to evaporate often till quite late in January. In some places a middle crop called Yedankar (I think) is started in October but I believe this custom is rare. The reservoir in question would not receive supplies in any large quantity until August and we could issue water for irrigation in September. If, however, none were to be used until the following January the loss would be so great as to make the project hopelessly unremunerative.

I have had a talk with the Collector and have pointed out that his opinion on the project generally is absolutely necessary before we can go any further. A map of the area affected will be sent to him and he will be asked to give his views on the project generally and to give special attention to the following points:—

(1) Assuming that we can supply water for 12,000 acres of rice or 30,000 acres of dry crop beginning from the end of August, should the project be a wet or a dry one or a combination of the two? It is to be noted that in the matter of duty the dry has but comparatively little advantage over the wet, the duty being but little more than double.

(2) Assuming that a rice project is undertaken, will it be better to take up an entirely new ayacut and let the drainage water flow into existing tanks or should the water be let into the tanks and the irrigation extended from it? Personally I am all in favour of the former method but there may be reasons such as a higher return or denser population to turn the scale in favour of the latter.

(3) Is the soil good enough to repay irrigating it? Is there any possibility of getting manure?

(4) What water-rates are we likely to realize and is there any tract within the commanded area where the soils are rich enough to command a higher water-rate than would be obtained from the ordinary red soils?

(5) Is the population sufficient to irrigate an extra area of 12,000 acres of rice?

(6) Are they likely to change their habits and utilize the water when it becomes available?

Pending a reply to these questions I venture to make a rough forecast which shows how very unpromising the project is.

I take Rs. 2–8–0 an acre as the highest water-rate we are likely to get over the whole ayacut.

		RS.
12,000 acres at Rs. 2–8–0		30,000
	RS.	
Maintenance at As. 12	9,000	
Collection charges	1,500	
		10,500
Net revenue ..		19,500

equivalent to 1 per cent. on the capital outlay.

14. Let us now see how the project is likely to fare as a famine-protective work. In the formula $C = 20\,r + mx$. On account of the unsatisfactory nature of the protection afforded (the project would entirely fail five times in thirty-six years), I would take m as 2·5 instead of 3. x for Anantapur = 41 and r works out to 1·6.

$C = 32{\cdot}5 + 102{\cdot}5 = 135$ estimated capital cost is 162. I would recommend that this work should be given up were it not for two facts—

(*a*) The area supplied is in extreme need of water and could the ignorance and the prejudice of the ryots be got over, the water could be usefully utilized.

(*b*) A large amount of work, in fact the greater part of it, is suitable for famine relief and in an area where relief works are frequently required. I am, therefore, instructing the Assistant Engineer to go on with the investigation pending the receipt of a report from the Collector.

The work he should do is—

(1) Deepen pits on the line of the weir to ascertain true depths of foundations;

(2) Make accurate estimate of the cost of bund based on the rates I have taken;

(3) Investigate the possibility of a right and left bank canal from Togarakunta tank, thus doing away with the necessity for an anicut altogether; or

(4) If this is not feasible select a site above Palcherla on the same stream, so that the good lands on either side of the vankah may be commanded.

These works should be carried out in close communication with the officers of the Revenue Department to whom I have already instructed the Assistant Engineer to send a map of the project.

15. Having made out such a very poor case for a reservoir project, it is necessary to devote a few words to the question of an anicut and supply channel, the form in which the project was originally thought of. In the first place I may say that I consider that there is no place in the Anantapur valley where reservoir sufficiently large to store the water diverted from the Pennér could be safely made. There is no good soil for a large reservoir bund. Bukkacherla tank which was proposed for enlargement is founded on a trap dyke and the bund could not be safely raised without removing the existing bund and then there would be no good earth. The capacity per foot of raising would not be good. Togarakunta tank might possibly be raised a bit, but it would not give any largely increased storage. A site has been proposed about three miles above Togarakunta where the stream passes through a gorge in the hills. Here the basin, though wide, is high above the stream level so that a very high dam would be necessary to give any storage. There is no earth for an earthen dam and a masonry one would be very expensive.

A good anicut could be constructed very cheaply near Oddurevu about four miles above Perur, but the cost of the channel would be prohibitive.

Assuming that we could take off about one-half the annual supply we may take an ayacut of 6,000 acres. This would require 1,566 millions cubic feet. We could not count on getting full supply in the channel for more than ten days in the year. The channel would therefore have to carry $\frac{1,566 \text{ millions}}{10 \times 86,400} = 2,044$ cusecs, which would necessitate a canal of such section as to be absolutely prohibitive with the big cuttings which the undulating and side-long sloping ground renders necessary.

The project now sketched out may be considered the only feasible one.

H. E. Clerk,
Supg. Engineer on Special duty.

No. 1355, *dated* 16*th July* 1906.

Copy forwarded to the Chief Engineer for Irrigation.

H. E. Clerk,
Supg. Engineer on Special duty.

VII

Letter—from H. E. Clerk, Esq., Superintending Engineer on Special duty.
To—the Chief Engineer for Irrigation.
Dated—Madras, the 17th July 1906.
No.—1365.

With reference to your No. 2525, dated 16th July 1906, I have the honour to invite your attention to my inspection notes, dated 22nd June to 1st July 1906 and communicated with this office No. 1355, dated 16th July 1906, which deal with the subject of the Upper Penner Reservoir Project.

VIII

Memorandum No. 360-O., dated 7th August 1906.

With reference to the correspondence ending with his letter No. 1365, dated 17th July 1906 on the subject of the Upper Penner Reservoir project, the Superintending Engineer on Special duty is requested to be so good as to put in hand the detailed investigation of the project making it as suitable for famine relief as possible. The undersigned considers that the project has not much chance of being sanctioned as a protective work. The formal order of Government sanctioning the detailed investigation will issue in due course.

(By Order.)

T. W. S. Smyth,
Asst. Chief Engineer for Irrigation.

To the Superintending Engineer on Special duty.

IX

Telegram—from the Assistant Chief Engineer for Irrigation.
To—the Superintending Engineer on Special duty.
Dated—21st September 1906.
No.—371-O.

Paragraph 13 of your No. 1355, dated 16th July, regarding Upper Penner project. Has Collector's opinion been received. If so, send it immediately to Ootacamund.

X

Letter—from H. E. Clerk, Esq., Superintending Engineer on Special duty.
To—the Chief Engineer for Irrigation.
Dated—Madras, the 22nd September 1906.
No.—1836.

With reference to your telegram of the 21st instant, I have the honour to forward herewith copy of letter from the Collector of Anantapur, No. 518, dated 9th August 1906.

Enclosures.

Letter—from I. MacIver, Esq., I.C.S., Acting Collector of Anantapur.
To—the Superintending Engineer on Special duty.
Dated—the 9th August 1906.
No.—R. Dis. 518.

I have the honour to make the following observations with reference to your inspection notes on the Upper Penner Reservoir Project.

Assuming that water for 12,000 acres of paddy or $2\frac{1}{2}$ times that area of dry crops can be provided, the inquiries since made confirm my first opinion that the project should be one for wet crops; that is, it should be so designed as to be suitable for as much wet irrigation as possible but no doubt some areas to which the water could be taken economically will for various reasons continue to be cultivated as dry lands : so I think instead of basing calculations on 12,000 acres of wet, roughly the same equivalent of wet and dry may be assumed thus :—

	ACS.
Wet ..	10,500
Dry ..	3,750
Total ..	14,250

this is on the assumption that a new ayacut is taken up and I agree that this would be the better course.

2. The new ayacut will have to be selected from an area to which the following figures apply :—

	Acres.	Wet assessment.	Dry assessment.	Difference (water-rates).
		RS.	RS.	RS.
Occupied	13,155	54,295	4,240	50,055
Unoccupied	16,999	57,111	..	..
	30,154	1,11,406	..	..
Inam ..	3,993	..	..	..
	34,147	..	..	..

The difference between the wet and dry rates on the occupied lands works out very nearly to Rs. 3–8–0 per acre, and the wet assessment on the unoccupied lands works out to Rs. 3–6–0 nearly; probably the dry assessment is not much more than the odd six annas but I have not got the exact figures; as the additional area of irrigation will naturally consist of the best portions of the above area, I do not think there is any reason why the standard water-rate of Rs. 4 per acre should not be adopted instead of the Rs. 2–8–0 rate assumed by you. That is for the irrigation of wet crops; for the irrigation of dry crops the standard rate of Rs. 3 may be assumed. The income from water-rate would then be—

	RS.
Wet Rs. 4 × 10,500	42,000
Dry Rs. 3 × 3,750	11,250
	53,250 as against

Rs. 30,000 assumed by you at the Rs. 2–8–0 rate. The whole of this will not be realized because the supply of water for 12,000 acres of paddy cultivation taken as the basis for these calculations includes drainage water that will find its way to existing tanks and some of this will be absorbed by existing cultivation without additional return. Some ryots will get perhaps twelve anna, instead of eight anna harvests but will pay no more revenue. On the other hand some Rs. 500 may be taken credit for as dry assessment on land at present unoccupied and likely to remain so unless this project makes it worth taking up: these two items may perhaps be left to balance one another.

When you were at Anantapur I believe I expressed the opinion that a low water-rate only could be expected; the figures now collected lead me to think that the standard water-rates are not too high in this case; the land is no doubt poor but under ordinary circumstances the standard water-rates are much below the value of the water.

3. All this is on the assumption that water can be provided to grow crops as stated above. I do not mean that I have any doubt as to the possibility of providing the necessary quantity of water, nor do I doubt that when the water is provided the ryots will in time provide labour and procure the necessary manure, and I feel confident that they will also in time make arrangements to use the water at the season which will give the best results, but the difficult question remains as to when that season would be; the ryots now all profess to be willing to take the water as soon as it becomes available and use it for the intermediate cultivation called "Edakar", but of course they will promise anything now in hopes of getting the project carried out; the question is whether crops raised at that period will be a complete success; it is impossible to believe that the ryots usually leave the water in their tanks to evaporate simply on account of obstinacy or senseless custom; the fact that they do so proves very conclusively to my mind that they have discovered that that course gives them in the long run the best outturn.

I should like to have had time to make inquiries as to the outturn obtained from this intermediate cultivation and as the reasons why it is not less uncommon; probably the fact is not that these early crops are not profitable but that for some climatic reason they are less profitable than those raised in the ordinary manner and so the ryots prefer to wait in hopes that they will have sufficient water for the latter; if they knew at first that they would not have water for the late crops they would then no doubt raise "Edakar" crops and in the case of lands registered as dry it is always possible to insist that water shall be taken early or not at all. It will only be necessary to refuse permission for water to be taken after a certain date or to charge a penal rate when it is so taken; so I think this difficulty can be overcome.

4. In this neighbourhood it is obvious that the big tanks have made the dense population and wealth and also the good wet soil wherever these exist to any extent, and the fact that these are wanting in a proposed ayacut is therefore not a reason for giving up the project; the ryots here irrigate their lands whenever there is any possible source and there need be no fear of their preferring to grow dry crops as the ryots do in some places.

5. I think the income that may be expected is considerably underestimated in your notes for the reasons stated above and that it will be possible to insist that the water shall be used at such seasons as will give the best return, and considering the great necessity of this part for protection from drought that the scheme deserves to be carried out. Of course the income will not for a considerable number of years rise to the maximum figures given above.

XI

Note by the Chief Engineer for Irrigation.

In February last, the Superintending Engineer on Special duty submitted a brief preliminary report on the Upper Penner Project, Anantapur district, received from Mr. Milner, Assistant Engineer in charge of the Cuddapah-Anantapur Investigation Party. The outlines of the scheme were the construction of a reservoir across the Penner above the village of Perur in the Dharmavaram taluk, and the excavation of channels therefrom to augment and improve the supply to fifteen tanks besides irrigating lands directly under them. The reservoir was expected to have a capacity of 7,178 millions cubic feet and to bring under cultivation a total area of 32,400 acres from which a net revenue of Rs. 1,13,120 was anticipated, representing a return of 3·23 per cent. on the proposed capital outlay of Rs. 34,97,122.

2. The Special Superintending Engineer pointed out that, of all the projects in the Cuddapah and Anantapur districts, this project was the most truly famine-protective and strongly recommended its complete and early investigation. He stated that there was only one point which required consideration and that was whether the quantity of water impounded in the reservoir could be abstracted from the Penner without detriment to the Tungabhadra Project. In memorandum No. 716, dated 27th February 1906, he was informed that the complete investigation of the project need not be deferred, on the ground that it would interfere with the supply to the Tungabhadra Project. As it was observed, however, from the statement of surplus discharges at Adinimoyapalli anicut that the reservoir would have failed, in four out of the last ten years, Mr. Clerk was requested to consider whether better results could not be attained with a smaller project.

3. The Special Superintending Engineer also reported that, on going carefully into the question of the supply available for the reservoir and taking the mean of the rainfalls for the last ten years at Madakasíra and Hindupur, it was observed that they fell below the average in seven out of ten years. As a more detailed estimate which had in the meantime been received from the Party Officer was considerably higher than was expected and as even this appeared to err on the low side, Mr. Clerk reported that the estimate would have to be raised to 45 lakhs which, he considered, was too high a price to pay for a project like the one proposed. He therefore withdrew his recommendation that the project should be fully investigated and stated that he had asked Mr. Milner to look out for a smaller project, as suggested.

4. In July last, the Special Superintending Engineer forwarded a copy of his Notes of Inspection of the Upper Pennér Reservoir Project dealing with the revised proposals submitted by the Party Officer. The modified project consisted in a reservoir of 3,000 millions of cubic feet made up mainly of the run-off from the portion of the catchment of the Pennér river lying in British territory and a main canal 15 miles long to irrigate 10,000 acres of wet crop directly under it and an area of 2,000 acres under existing tanks. Mr. Clerk estimated the cost of the project at Rs. 19,31,196 (including indirect charges). He said that he was inclined to design the project for the irrigation of dry crops, but that this and other kindred questions had to be investigated by the Collector, who was about to be addressed. Pending such an investigation, Mr. Clerk calculated on a water-rate of Rs. 2–8–0 an acre throughout the whole ayacut, which gave a net revenue of Rs. 19,500 or a return of 1 per cent. on the capital outlay.

5. The Special Superintending Engineer stated that he would recommend the abandonment of the project, were it not for the fact that the area proposed to be supplied was in extreme need of water, that a greater portion of the work was suitable for famine relief and that the project was situated in a tract where relief works were

frequently required. It was reported that instructions had accordingly been issued to the officer in charge of the Cuddapah-Anantapur Party to go on with the investigation of the project, pending the receipt of a report from the Collector of Cuddapah on the revenue questions.

6. There being very little chance of the project being sanctioned as a protective work and the work lying in an area subject to the vicissitudes of famine, the Special Superintending Engineer was requested to put in hand the detailed investigation of the project making it suitable, as far as possible, for purposes of famine relief.

C. A. Smith,
Ag. Chief Engineer for Irrigation.

21st September 1906.

Order—No. 1060 I., dated 6th October 1906.

The action of the Chief Engineer for Irrigation is approved.

(True Extract.)

C. A. Smith,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, III Circle.
,, Examiner, Public Works Accounts.
,, Revenue Department.
,, Board of Revenue (Revenue Settlement).

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT

Recd.	1906.	*Enclosures*	
Regd.		*Spare copies*	

G.O., No. $\frac{1060}{A}$ I., 6th October 1906.

Divi flood banks, Kistna District

An estimate, amounting to Rs. 1,20,700, for raising, strengthening and extending the —, sanctioned with remarks.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

G.O., No. 1136 I., dated 4th December 1903.

II

From the Chief Engineer on Special Duty, dated 10th February 1904, No. 312.

To the Executive Engineer, Kistna Reservoir Project, through the Chief Engineer on Special Duty, dated 19th February 1904, No. 575.

From the Chief Engineer on Special Duty,			dated	19th Feb. 1904,	No.	348.
"	"	"	"	20th " "	"	350.
To the	"	"	"	29th " "	"	644.
" Superintending Engineer, II Circle			"	29th " "	"	645.
From the Chief Engineer on Special Duty			"	11th July "	"	1030.
To the Superintending Engineer, II Circle			"	18th " "	"	2384.
"	"	II "	"	15th Feb. 1905	"	506.
From the	"	II "	"	5th April "	"	4 I.
To the	"	II "	"	19th " "	"	1323.
From the	"	II "	"	21st " "	"	29 I.
To the	"	II "	"	2nd May "	"	21 O.
From the	"	II "	"	19th " "	"	72 I.
"	"	II "	"	30th " "	"	86 I.
To the	"	II "	"	1st July "	"	2055.
From the	"	II "	"	29th " "	"	179 I.
To the	"	II "	"	11th Aug. "	"	2512.
From the	"	II "	"	23rd Oct. "	"	357 I.
To the	"	II "	"	31st " "	"	3403.
From the	"	II "	"	26th Mar. 1906	"	613 I.
To the	"	II "	"	5th April "	"	1242.
From the	"	II "	"	2nd June "	"	120 I.
"	"	II "	"	15th Aug. "	"	237 I.
"	"	II "	"	23rd " "	"	271 I.
To the	"	II "	"	30th " "	"	3143.
From the	"	II "	"	13th Sept. "	"	322 I.
"	"	II "	"	13th " "	"	326 I.

Enclosure.

Report to accompany the estimate for raising and strengthening Divi right and left flood banks and extending the same.

	RS.
Amount of estimate	1,15,800

During the unprecedented floods in the Kistna river of October 1903, numerous breaches occurred in the Divi right and left flood banks (in several places the whole bank being washed away for several furlongs at a stretch) resulting in breaching all the tanks in Divi Island, and causing considerable damage all over the Island. These breaches have now all been closed and the flood banks brought up to the section they were before the floods occurred under an estimate for Rs. 28,400 for emergent repairs to flood bank around Divi.

This estimate now provides for raising the flood banks to 5′ above M.F.L. and 10′ top width, and side slopes 1½ to 1 in accordance with orders contained in Chief Engineer's No. 644, dated 29th February 1904 and to extend the right and left flood banks by ⅝ and ⅜ miles respectively. Owing to large breaches, the M.F.L. as actually observed was found to be unreliable. In preparing these estimates therefore an assumed M.F.L. has been obtained by taking a M.F.L. at the head of Divi of *plus* 25·00, as actually observed, and allowing a fall of 1 foot per mile from here to the end of the flood banks.

Provision has been made in the estimate for acquiring land permanently where required, and also for compensation for temporary occupation of land for borrow pits. The rates for compensation have been settled in consideration of those now being paid by the Revenue Department for land acquired for emergent repairs to Divi flood bank.

31st July 1904. E. W. P. Walsh,
Assistant Engineer.

9th August 1905. C. Peddie,
Ex. Engr., Kistna Eastern Dn.

III

Note by the Chief Engineer for Irrigation.

In passing orders on the inspection notes of the Chief Engineer for Irrigation on the damages caused to the works of the Kistna delta by the extraordinary floods of 1903, it was decided in G.O., No. 1136 I., dated 4th December 1903, that the banks of the river should be raised by 2 feet above the M.F.L. of that year with a top width of 10 feet. Detailed estimates were accordingly called for for the proposed work. When the estimate for repairing the banks with the above section was under preparation by the Executive Engineer, Kistna Eastern Division, Mr. Reid, then Executive Engineer, Kistna Reservoir Project, pointed out that from the standpoint of the Divi Pumping Project, the margin proposed for the banks was insufficient and that he would propose its being increased to 5 feet. He further considered that the extension of the flood banks of Divi on either branch of the river was necessary independently of the Divi Pumping Project. The Chief Engineer on Special duty, through whom Mr. Reid submitted the above proposals, urged that the level and section recommended by the latter officer might be adopted for the banks as a special case. This standard for the flood banks was approved in this office Memorandum No. 644, dated 29th February 1904, and the Chief Engineer on Special duty was asked to assist the Superintending Engineer, II Circle, with any useful levels that might have been available with Mr. Reid to admit of the necessary estimates being prepared and submitted at an early date.

2. With his letters No. 86 I., dated 30th May 1905 and No. 179 I., dated 29th July 1905, the Superintending Engineer submitted plans and estimates, amounting to Rs. 22,640 and Rs. 1,15,800 (1) for extending the right and left flood banks of Divi Island by 5 miles 2 furlongs and 3 miles, respectively, with a top width of 6 feet and (2) for raising the existing flood banks with a top width of 10 feet, a margin of 5 feet above M F.L. of 1903 being allowed throughout. But as the provision of Rs. 3,740 and Rs. 20,296 made, in the estimates, for land compensation did not appear to have been based on information obtained from the local Revenue officers, the Superintending

Engineer was asked to have the figures verified in consultation with the Collector. He was requested at the same time to revise the estimate for the extension of the banks, allowing a top width of 10 feet instead of 6 feet as provided for by him. In reply the Superintending Engineer reported that the correct amounts for compensation for land required for extending and raising the flood banks, as ascertained from the Revenue officers, were Rs. 3,120 and Rs. 19,050, respectively, and submitted a revised estimate, amounting to Rs. 26,620 for the former work.

3. In his letter No. 237 I., dated 15th August 1906, the Superintending Engineer, II Circle, however, stated that in consideration of the difference between the M.F.L. at the head and that at the tail end of the Divi Island, it was unnecessary to allow a margin of 5 feet for the banks throughout and suggested that the height of the banks might be gradually reduced from 5 feet at the head to 3 feet at the tail end or the 14th mile. This suggestion having been approved by the Chief Engineer for Irrigation, the estimate for raising the banks was accordingly revised, the proposed extension being also given a margin of 3 feet throughout. The estimates, as altered, amount to Rs. 1,20,700 inclusive of the provision of Rs. 5,400 now made therein, at the request of the Superintending Engineer, for the Revenue establishment that will be employed in connection with the acquisition of land required for the work. As the two estimates relate to one and the same work they will be treated as one estimate. It is recommended that the estimate, as revised, be sanctioned under "43. Minor Works and Navigation—Agricultural Works".

4. It is observed from the Executive Engineer's letter received with the Superintending Engineer's endorsement No. 326 I., dated 13th September 1906, that a sum of Rs. 3,600 will be required during the current year to meet the cost of the Revenue establishment. This amount may be provided from the reserve at the disposal of Government under "Provincial, 43. Minor Works and Navigation".

C. A. Smith,
Ag. Chief Engineer for Irrigation.

2nd October 1906.

Order—No. $\frac{1060}{A}$ I., dated 6th October 1906.

The following estimate is sanctioned:—

Provincial.
Irrigation.
43. Minor Works and Navigation.
Class V. Agricultural Works.
Kistna Eastern Division.
Original Works.
Raising and extending the Divi flood banks.

	RS.	RS.
Estimate—		
(i) Raising and strengthening the flood banks ...	77,530	
Compensation for land	19,050	
		96,580
(ii) Extending the flood banks	15,600	
Compensation for land	3,120	
		18,720
Cost of the Revenue establishment to be employed on the acquisition of land		5,400
Total ...		1,20,700

2. This sanction is registered as No. 160 I. of 1906–1907.

3. The sum of Rs. 3,600 referred to in paragraph 4 of the Chief Engineer's note will be provided from the reserve at the disposal of Government under "43. Minor Works and Navigation" which will thereby be reduced to Rs. 5,983.

4. The following telegram will be sent :—

To the Superintending Engineer, II Circle.

"Divi flood bank estimate sanctioned. Order follows".

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle, with plans and estimates.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 1063 I., 9th October 1906.

Annual Administrative Accounts

Copy of a letter from the Government of India stating that the expenditure under the departmental heads I. A.—Extensions and Improvements and I. B.—Maintenance and Repairs in Account No. 3 (Revenue Account) of the — may be shown in total by main heads instead of by sub-heads as heretofore, communicated to the Examiner, Public Works Accounts, for information and guidance.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

Letter—from Mr. L. M. JACOB, C.S.I., Secretary to the Government of India, Public Works Department (Account—Irrigation).
To—the Secretary to the Government of the Punjab, Public Works Department (Irrigation Branch).
Dated—Simla, the 17th September 1906.
No.—104-A.I.

With reference to your letter No. 0865-A.I., dated 3rd September 1906, I am directed to state that the Government of India accept your recommendation that the expenditure under the departmental heads I. A.—Extensions and Improvements and I. B.—Maintenance and Repairs in Account No. 3 (Revenue Account) of the Annual Administrative Accounts may be shown *in total* by main heads, that is, Head Works, Main Canals and Branches, etc., instead of by sub-heads as heretofore.

"A to P" as indicated in Standing Order No. 2, dated 6th June 1901, to Public Works Department Code, volume II, appendix 22, pages 355 to 366.

ENCLOSURES.

Letter—from J. J. MULLALY, Esq., Secretary to the Government of the Punjab, Public Works Department (Irrigation Branch).
To—the Secretary to the Government of India, Public Works Department.
Dated—Simla, the 3rd September 1906.
No.—0865-A.I.

I am directed to forward copy of a letter No. 11559-A.I., dated 17th August 1906, from the Examiner, Public Works Accounts, Punjab, enquiring whether there is any objection to the discontinuance of the practice of showing expenditure by sub-heads—B. Land, C. Works, etc., under I. A.—Extensions and Improvements and I. B.—Maintenance and Repairs in Annual Administrative Account No. 3 (Revenue Account) and to say that as the details in question serve no useful purpose in this office, the adoption of the Examiner's proposal under which the expenditure under I. A. and I. B. will be shown by main heads (1) Head Works, (2) Main Canals and Branches, etc., and not by sub-heads, is recommended for the sanction of the Government of India.

2. I am to add that outlay by sub-heads will, however, continue to be kept in the Divisional accounts and in the books of the office of the Examiner, Public Works Accounts, Punjab, and will therefore always be available for reference, if necessary.

Letter—from C. S. B. SINCLAIR, Esq., Examiner, Public Works Accounts, Punjab.
To—the Secretary to the Government of the Punjab, Public Works Department, (Irrigation Branch).
Dated—Lahore, the 17th August 1906.
No.—11559-A.I.

On reference to the annual accounts for 1905-1906, it has come to my notice that, in the case of canals noted in the margin, the expenditure on I. A.—Extensions and Improvements and I. B.—Maintenance and Repairs, though recorded by sub-heads of classification *during the year*, is being brought forward and shown against main heads in Administrative Account No. 3 in lump sums owing to the original outlay in earlier years not having been so detailed in the accounts of those periods.

Western Jumna canal.
Bari Doab canal.
Upper Sutlej Inundation canals.
Indus Inundation canals.
Lower Sutlej Inundation canals.
Shahpur canals—Imperial.
Chenab Inundation canals.

2. In the case of other canals, however, full details by sub-heads are given, but the question arises whether, from the fact of their not having been found necessary in certain instances, these details by sub-heads serve any useful purpose of reference either to the Local or Supreme Governments. While, therefore, the importance of these numerous figures is very doubtful, they entail much clerical labour in the preparation of the account.

3. Under these circumstances, I am of opinion that the details by *sub-heads* might advantageously be dispensed with and should this proposal commend itself to the Local Government, I would suggest that Government of India's sanction may be obtained to the elimination of the information from the future Annual Administrative Account No. 3.

4. The outlay by sub-heads will, as a matter of course, continue to be kept in the Divisional accounts and the books of this office and the omission of the figures from the administrative accounts will not in any way interfere with or weaken the check now exercised by this office on the expenditure against the different sub-heads and the information will always be available, if ever required.

5. This proposal is not intended to affect Capital Outlay Administrative Account No. 2, in which details will regularly appear as heretofore.

No. 105-A.I., dated 17th September 1906.

Copy, with copy of letter replied to (with copy of enclosure), forwarded to the Secretary to the Government of Madras, Public Works Department, for information and guidance.

W. F. O'DONOGHUE,
Dy. Secy. to the Govt. of India.

Order—No. 1063 I., dated 9th October 1906.

Communicated to the Examiner, Public Works Accounts, for information and guidance.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906.
Regd.

Enclosures

Spare copies

G.O., No. 1064 I., 9th October 1906.

Floating plant of the Kurnool-Cuddapah Canal

An estimate, amounting to Rs. 952, of the cost of maintenance of the — for 1907-1908, approved.

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

Letter—from G. F. HANDCOCK, Esq., Superintending Engineer, III Circle.
To—the Chief Engineer for Irrigation.
Dated—Bellary, the 28th September 1906.
No.—4674.

I have the honour to submit, for favour of the sanction of Government, the marginally-noted estimates, amounting to Rs. 952 (supplemented by statements), for the annual upkeep of the boats on the Kurnool-Cuddapah Canal for 1907–1908.

Parts II, III and IV.

2. The proposed expenditure in 1907–1908 is Rs. 952 against an expected revenue from the boats of about Rs. 1,001.

ENCLOSURES.

PART II.—Statement of irrigation floating plant in Kurnool division showing the estimated cost of upkeep during 1907–1908.

Register number of boat.	Detail of plant description of boat.	Date of construction.	Measurement of plant. Hull over all. Length.	Breadth.	Depth.	Draft when loaded. Feet.	Inches.	Tonnage.	Value of plant. Original.	Present book value.	Probable cost of upkeep in 1907–1908.
	Staff boats.								RS.	RS.	RS.
10	Duke	1879–80 1882–83	47	8	3	2	..	12	3,370	1,871	100
11	Chairman	Do.							3,370	2,234	100
8	Sir Arthur	Do.							3,370	1,375	60
	Total ..	..	..	..	..	..	..	..	10,110	5,480	260
	Pulicat boat No. 1	1891–92	..	..	..	..	..	2	200	98	15
	,, No. 2	Do.	..	..	..	..	..	2	200	60	20
	Total ..	..	..	..	..	..	..	..	400	158	35
	Passenger boats.										
4	Rat	1879–80 1882–83							3,548	1,715	95
5	Peacock	Do.	56	8	3	2	6	16	3,548	1,340	90
6	Elephant	Do.							3,548	1,608	85
2	Kite	Do.							3,548	1,195	95
9	Ram	Do.							3,548	1,951	100
	Total ..	..	..	..	..	..	..	..	17,740	7,809	465
	Cargo boats.										
56	Seetha	1879–80 1882–83	56	8	36	3	..	24	3,604	859	60
62	Queen Boadicea	Do.							3,604	973	60
63	,, Scotts	Do.							3,604	1,108	50
	Total ..	..	..	..	..	..	..	..	10,812	2,940	170
	4 Punts ..	1885–86	..	..	..	..	..	..	280	108	22

PART III.—Detailed approximate estimate of the annual cost of the maintenance of floating plant for 1907–1908.

—	Staff. Duke.	Staff. Chairman.	Staff. Sir Arthur.	Staff. No. 1 Pulicat.	Staff. No. 2 Pulicat.	Passenger. Rat.	Passenger. Peacock.	Passenger. Elephant.	Passenger. Ram.	Passenger. Kite.	Cargo. Seetha.	Cargo. Queen Boadicea.	Cargo. Queen Scotts.	Punts.
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
Docking and launching.	3	3	3	..	..	3	3	3	3	3	3	3	3	..
Painting	37	37	15	4	4	36	36	36	36	36	15	15	15	..
Caulking	8	8	1	5	5	9	9	9	9	9	1	1	1	10
Tarring	3	3	4	1	1	4	4	4	4	4	4	4	4	4
Rope, etc.	12	12	12	1	1	12	12	12	12	12	12	12	12	1
Sundry repairs ..	37	37	25	4	9	31	26	21	36	31	25	25	15	7
Total ..	100	100	60	15	20	95	90	85	100	95	60	60	50	22
	260			35		465					170			22

PART IV.—Abstract showing the comparison of detail between the estimate and maintenance cost of floating plant in the Kurnool division for 1906–1907 and 1907–1908.

Item No.	—	Number. 1907–1908.	Number. 1906–1907.	Original value. 1907–1908.	Original value. 1906–1907.	Book value. 1907–1908.	Book value. 1906–1907.	Cost of upkeep. 1907–1908.	Cost of upkeep. 1906–1907.
				RS.	RS.	RS.	RS.	RS.	RS.
1	Staff boats	3	3	10,110	10,110	5,480	5,480	260	280
2	Pulicat boats	2	2	400	400	158	158	35	15
3	Passenger boats	5	5	17,740	17,740	7,809	7,809	465	435
4	Cargo boats	3	3	10,812	10,812	2,940	2,940	170	103
5	Punts	4	4	280	280	108	108	22	10
	Total ..	17	17	39,342	39,342	16,495	16,495	952	843

G. S. RAMA AIYAR,
Executive Engineer.

II

Note by the Chief Engineer for Irrigation.

In the accompanying statements submitted by the Superintending Engineer, III Circle, the cost of maintenance of the floating plant of the Kurnool-Cuddapah Canal for the next official year is estimated at Rs. 952 against Rs. 843 for the current year, the increase being chiefly due to provision having been made for repairs to the cargo boat "Seetha". The estimate may be approved.

C. A. SMITH,
Ag. Chief Engineer for Irrigation.

Order—No. 1064 I., dated 9th October 1906.

The estimate of the cost of maintenance of the floating plant of the Kurnool-Cuddapah Canal is approved. A sum of Rs. 952 will be provided on this account in the budget estimate for "Minor Works and Navigation" for 1907-1908.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, III Circle.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*
Regd. *Spare copies*

G.O., No. 1066 I., 12th October 1906.

Coleroon left bank

A supplemental estimate, amounting to Rs. 470, for diverting the — below the 20th mile in Mangammalpuram village, Trichinopoly district, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

G.O., No. 265 I., dated 9th March 1904.

II

Letter—from S. B. MURRAY, Esq., Superintending Engineer, VI Circle.
To—the Chief Engineer for Irrigation.
Dated—Trichinopoly, the 27th September 1906.
No.—547/C.E.

I have the honour to forward herewith for your approval and the sanction of Government an estimate, amounting to Rs. 470, supplemental to the one sanctioned in G.O., No. 265 I., dated 9th March 1904, for diverting the Coleroon left bank below the 20th mile, in Mangammalpuram village, Trichinopoly district.

This supplemental estimate has been found necessary, as land measuring 2·3 acres (detailed in the statement and shown in the blue print accompanying the estimate), lying between the old and the new bank (proposed diversion), which has been rendered unfit for cultivation, has to be acquired.

2. The value of this land has been fixed by the Revenue department.

3. The Collector of Trichinopoly, to whom a reference was made on the subject by the Executive Engineer, Trichinopoly division, is also of opinion that the land in question should be acquired. (Please see copy of Collector's reply enclosed for information).

ENCLOSURES.

Letter—from the Collector of Trichinopoly.
To—the Executive Engineer, Trichinopoly Division.
Dated—the 4th March 1905.
No.—2673/Rev. of 1904.

With reference to your letter No. 811-S., dated 10th November 1904, I have the honour to inform you that the necessary draft declaration for the acquisition of the 2·74 acres therein applied for is being submitted to Government to-day for publication.

In this connection I enclose a copy of the Assistant Collector's D.Dis. No. 64/Rev., dated 14th February 1905, suggesting the remaining portion of the patta land now unfit for cultivation, lying between the new and old embankments of the Coleroon, may also be acquired under the Act as the case of similar lands in Panayapuram and Tiruvalarsolai villages, which were ordered to be acquired in G.O., No. 668, Revenue, dated 24th June 1904 (*vide* your letters No. 323-S.E., dated 6th September 1904 and 9th November 1904).

The lands in Mangammalpuram measure 2·40 acres and apparently they also should be acquired. If you also agree, I request that you will be good enough to send me the necessary land plan and schedule for the acquisition of the same.

STATEMENT showing the lands lying between the old and new bank in Mangammalpuram limits, Trichinopoly Division.

Survey Number.		Name of Pattadar.	Wet or dry.	Extent of lands.	Area of square links.	Acreage.	
Number.	Letter.					Acres.	Cents.
193	6	Mariayee	Wet.	$240 \times \frac{100}{2}$	12,000	..	12
..	7	Do.	Do.	$243\frac{1}{2} \times \frac{140 + 100}{2}$	29,220	..	29·22
194	..	Sundararaja Iyengar .. .. Kristnasami Iyengar .. .. Parattaya Muthirian	Do.	$\frac{550 + 580}{2} \times \frac{140 + 150}{2}$	81,925	..	81·925
173	6	Parattaya Muthirian	Do.	$500 \times \frac{150 + 160}{2}$	77,500	..	77½
			Do.	$160 \times \frac{160 + 70}{2}$	18,400	..	18·4
..	7	C. Srinivasa Iyengar	Do.	$115\frac{1}{2} \times \frac{70 + 40}{2}$	6,352	..	6·352
174	1	Mariayee	Do.	$117\frac{1}{2} \times \frac{40 + 20}{2}$	3,525	..	3·525
						2	28·9
						or say 2·3 acres.	

M. MANICKAM,
Executive Engineer, Trichinopoly Division.

III

Note by the Chief Engineer for Irrigation.

In G.O., No. 265 I., dated 9th March 1904, an estimate, amounting to Rs. 3,160, for diverting the Coleroon left bank below the 20th mile in Mangammalpuram limits, Trichinopoly division, was sanctioned. The Superintending Engineer, VI Circle, now submits a supplemental estimate for Rs. 470 for acquiring 2·3 acres of land found necessary for the proposed diversion. It is recommended that the supplemental estimate be sanctioned.

8th October 1906.

C. A. SMITH,
Ag. Chief Engineer for Irrigation.

Order—No. 1066 I., dated 12th October 1906.

The supplemental estimate, amounting to Rs. 470, for diverting the Coleroon left bank below the 20th mile in Mangammalpuram village, Trichinopoly district, is sanctioned.

2. This sanction is registered as No. 153 I. of 1906–1907.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, VI Circle, with plans and estimate.
,, Examiner, Public Works Accounts.

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1067 I., 12th October 1906.

Swarnamukhi Project, Nellore district

Letter from the Superintending Engineer on Special duty stating that he cannot recommend the scheme for improving the supply to the Swarnamukhi below the Pulikalva head by building an anicut at the head, recorded.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers:—

I

G.O., No. 896 I., dated 22nd August 1906.

II

Memorandum No. 2364, dated 6th July 1906.

With reference to the correspondence ending with his letter No. 1169, dated 18th June 1906, on the Swarnamukhi Project, the Superintending Engineer on Special duty is informed that the Government propose to finally abandon the project and that orders to this effect will issue shortly.

The Special Superintending Engineer is, however, requested to be good enough to report whether he considers that it will be possible to improve the supply to the Swarnamukhi below the Pulikalva head by building an anicut or regulator at the head of the Pulikalva, so as to enable only sufficient supply to be sent down it for the existing irrigation. It is understood from the correspondence that this was proposed long ago but was dropped.

There seems to be no doubt that regulation of the supply to Pulikalva if practicable, would be of considerable use to Swarnamukhi irrigation and now that the complete project has been investigated and condemned, it is desirable to reconsider the smaller question.

C. A. SMITH,
Ag. Chief Engineer for Irrigation.

To the Superintending Engineer on Special duty.

III

Letter—from H. E. CLERK, Esq., Superintending Engineer on Special duty.
To—the Chief Engineer for Irrigation.
Dated—the 11th August 1906.
No.—1495.

With reference to your memorandum No. 2364, dated 6th July 1906, I have the honour to enclose a letter from M.R.Ry. V. T. Srinivasa Aiyangar on the subject of the Swarnamukhi project.

2. It will be seen that he considers that the construction of a regulator at the head of the Pulikalva will cost Rs. 70,000 or only Rs. 30,000 less than the scheme proposed by him and will not have the effect of improving the supply to Kotapennaka tank, the main object of the project. In fact, as he explains, the principal person to benefit by this proposal would be the zamindar.

3. As far as I can judge without having inspected the place, the view held by the Sub-Engineer is correct. The works proposed by him (reduced to their cheapest possible form) should be carried out, or, the conditions left as they are, in which case the position of the ryots under Kotapennaka tank is likely to grow worse.

4. My own opinion is that this work is one which is not properly a famine-protective work at all but should be considered as a Provincial irrigation work carried out mainly in the interests of existing irrigation. If this view were accepted and the work carried out from Provincial funds, the revenue expected to be derived from it is quite enough to make it worth doing, and I believe that the work would be a valuable one.

ENCLOSURES.

Letter—from M.R.Ry. V. T. SRINIVASA AIYANGAR Avargal, B.A., B.C.E., Officer in charge, Ganjám Investigation Party.

To—the Special Superintending Engineer, Madras.

Dated—Berhampur, the 21st July 1906.

No.—661.

With reference to your telegram, dated 20th July 1906, I have the honour to inform you that any remedy other than what has been already suggested cannot be said to be thorough.

I have not now before me papers, etc., regarding the Swarnamukhi scheme to refer to, and the cost therefore of proposals I now put forward, I am not able to estimate—

(1) To close the Pulikalva by an earthen bank as proposed in the plan already submitted.

(2) To construct a regulator across the Callakalva at its head as previously proposed.

(3) To restore the old source of supply to Kotapennaka tank, which existed prior to the construction of the head sluice and supply channel from above the Callakalva anicut.

(4) To reconstruct the anicut noted in (paragraph 3) with 3 feet falling shutters added to its top, in preference to the existing one with calingulah stones.

Proposal (1).—A regulator at the head will cost heavily. The records brought to light by the Special Tahsildar, clearly prove that the breach is not yet 60 years old, and the Government can therefore close it entirely.

This step will cut off the supply to Vakaud (Government) and Mallum, etc. (zamin) tanks from the Swarnamukhi and make them depend on Pulikalva as they were before the occurrence of the breach. I don't think Vakaud tank will suffer in any way; but if it is seen it does, an old supply channel to it (traces of which can be seen now) from the Swarnamukhi, about a mile above the head of Callakalva, can be restored. This is not likely to cost more than Rs. 10,000. A solid anicut 6 feet above bed may be substituted instead; but it will cost more.

The extra discharge thrown into the Swarnamukhi by closing the Pulikalva entirely, cannot raise the flood level of the main river by more than a foot.

Proposal (2).—This regulator will effectively shut out the floods of the Swarnamukhi from doing damage to lands under the Callakalva, as it does now, and regulate the supply into Kotapennaka tank and into the Callakalva, during periods of maximum floods according to its carrying capacity. The absence of such a regulator was a source of danger to the tank, which was then breaching badly as the flood waters entered in without control.

Cill level to be a foot lower than the deep bed of the Callakalva at its head, to increase the draught of water into the kalva.

Proposal (3).—The renewal of this source will give the tank the advantage of absorbing all the water that enter the Callakalva without the expense of digging a capacious channel. This arrangement may be said to silt up the bed of the tank. But with the regulator at the head, there is no reason why the deposit should be more than what it is now.

Proposal (4).—Will have the advantage of increasing the draught of water into the Callakalva, and thus to a certain extent minimise the disadvantage of not having a regulator across the Swarnamukhi.

These proposals have the advantage of fitting in square with those of the bigger scheme when it comes to be executed at some future time on the representation of the zamindar whom I expect to approach the Government about the extension of irrigation to his land also.

No. 1067 I., 12th October 1906.

Letter—from M.R.Ry. V. T. Srinivasa Aiyangar, Avergal, B.A., B.C.E., Sub-Engineer, Public Works Department, Tanjore.

To—the Special Superintending Engineer, Madras.

Dated—the 2nd August 1906.

With reference to your No. 1416, dated 27th July 1906, I have the honour to inform you that the proposals contained in my No. 661, dated 21st July 1906, were made, as I now understand, under the misapprehension that the Chief Engineer will be prepared to consider any reasonable scheme, that can restore the irrigation of Kota and other Government villages fed by the Swarnamukhi to its original state and prevent its further deterioration if the cost of such a scheme are not prohibitive. The regulation of Pulikalva did not seem to me to go far enough towards improving the existing state of things and I therefore ventured to suggest what in my opinion seemed necessary. These have no bearing with the original scheme except that it happens to form a part of it. I give below the history of the irrigation of the Government villages under the Swarnamukhi as it will suggest what improvements are necessary to restore it to original condition.

The Callakalva was originally an offtake from the Swarnamukhi from near Gudali to irrigate about 1,000 acres belonging to Kota and other Government villages direct, and to feed the Kotapennaka tank having an ayacut of 3,050 acres. A calingula with uprights, at its head founded on sheet laterite rock, which is now in ruins, regulated the supply into it, when the main Swarnamukhi was in freshes. A masonry anicut now in order, founded also on sheet laterite rock, a mile and a half lower down the Callakalva with uprights 3 feet high fixed to its top diverted supply to Pantakalva to its right and Pathikalva to its left to irrigate the 1,000 acres direct.

The excess flow over the anicut entered the Pennaka tank situated two miles lower down at its right flank. A deep channel cut in the laterite rock at the Callakalva head, 3 feet to 4 feet deeper than its bed, enabled the Government ryots to draw off all the available spring supply to their lands under the Pantakalva which preferential right they enjoy to date: a low level sluice in the body of the anicut below admitted this supply after March and April to low level lands under Pennaka tank which are not cultivated earlier on account of their submersion. After some time the calingula at its head failed and flood waters poured into the Callakalva uncontrolled and through it into the Pennaka tank, which breached often in consequence. The subsequent breach of the Swarnamukhi into the Pulikalva about 1,859 did not seem to have rendered this regulation at the head of Callakalva unnecessary, and breaches in the Pennaka tank were as frequent as before. The difficulty of conserving the spring supply in the river to Kota lands which in ordinary years is not much, became greater after the breach and has now become almost a hopeless task as the zamindari ryots under the Pulikalva undo clandestinely the work done by the Government ryots.

About the early nineties the Government found it necessary to control the supply entering the Pennaka tank to render it safe. They accordingly closed the original source of supply at the right flank and excavated a fresh channel to feed the tank from above the anicut with a sluice at its head. This arrangement restricted the inflow into the tank to such an extent that it does not at present generally fill in ordinary years; and further it caused considerable damage to lands lower down the Callakalva by allowing the supply entering it at its head uncontrolled to flow over them.

Thus the ryots of Kota and other Government villages at present do not get as much spring supply as they were getting prior to the breach of the river into the Pulikalva; they have lost the advantage they had of utilizing all available supply in the Callakalva, in filling the Pennaka tank, and they suffer heavy damages every year by the flood waters of the Swarnamukhi entering uncontrolled the Callakalva and flowing over their lands.

A regulator or an anicut with a sluice to admit supply to existing irrigation, as proposed by the Chief Engineer, at the head of the Pulikalva cannot be said by itself to remedy all the defects above named unless coupled with other works proposed in my No. 661, dated 21st July 1906. It will on the other hand benefit the zamindar greatly by shutting out the floods from Pulikalva from damaging his lands by submersion, and regulating the supply into it at other times.

A regulator at the head of the Pulikalva will have to be founded on wells suspended in sand and will consist of five forty-foot vents. It will cost not less than Rs. 70,000. The scheme suggested by me though costing about Rs. 30,000 more will restore the old order of things and that in a more efficient way. It will further stop further inroads of the zamindar into the supply available in the Swarnamukhi by clearly defining his rights. If this fails to appeal on score of heavy cost, I would suggest leaving things as they are. The condition of ryots in course of time by such a step is sure to grow worse and any remedy then would be impossible, as the zamindar after twelve years from now would acquire the prescriptive right of demanding unrestricted supply to the Pulikalva from the Swarnamukhi.

The Special Tahsildar in his report on the Swarnamukhi project does not seem to have considered fully the rights of the zamindar for Swarnamukhi works under various sources of irrigation he has from it at present. A reconsideration of the whole case, if feasible, after fresh enquiry by a responsible and experienced officer, is much to be wished when the condition of the ryots under the Government are considered. I will be glad to place at the disposal of such an officer for his consideration the results of my investigation since the Tahsildar who originally investigated is now no more.

IV

Memorandum No. 3349, dated 14th September 1906.

Has the honour to point out that the proposals now made by Mr. V. T. Srinivasa Aiyangar appear to be more or less the same as those suggested by the Special Superintending Engineer in his No. 2500, dated 8th December 1905, but which he did not then recommend and which were not approved of by the Collector and Board of Revenue.

From the above letter of the Special Superintending Engineer and from Collector of Nellore No. 117-R./Ver., dated 1st March 1906, it seems clear that while the closing of the Pulikalva is regarded as an essential part of any scheme which is likely to be of any use to Swarnamukhi irrigation, this work by itself will not help matter and that about the cost of a regulator to Pulikalva is heavy ; even this will be of no practical use. It must therefore apparently be now taken for granted that the Special Superintending Engineer cannot recommend anything being done short of the complete scheme, the further investigation of which has been ordered in G.O., No. 896 I., dated 22nd August 1906, to be abandoned.

The Special Superintending Engineer is requested to be good enough to report if this conclusion is correct.

C. A. SMITH,
Ag. Chief Engineer for Irrigation.

To the Superintending Engineer on Special duty.

V

Letter—from H. E. CLERK, Esq., Superintending Engineer on Special duty.
To—the Chief Engineer for Irrigation.
Dated—Madras, the 17th September 1906.
No.—1800.

With reference to your No. 3349, dated 14th September 1906, I have the honour to report that the conclusion arrived at in the latter part of paragraph 2 of the above quoted memorandum is correct.

Order—No. 1067 I., dated 12th October 1906.

Recorded.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle.
,, Board of Revenue (Revenue Settlement).
Copy to the Revenue Department.

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 1068 I., 12th October 1906.

Kistna Main Canal steps at Bezwada

Informing certain petitioners that the restrictions imposed by the Executive Engineer in regard to the use of the — are considered desirable in the interests of the public health at Bezwada and that His Excellency the Governor in Council sees no reason to interfere in the matter.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

READ—the following papers :—

I

Telegram from Madisetti Rangayya complaining that Mr. Brown prevents the public of Bezwada from taking water from the main canal at Bezwada, dated 21st July 1906.

Telegram, dated 25th July 1906, and petition, dated 25th July 1906, from the Secretary, Vijayavadha Sabha.

Petition from Chinna Pagada Narayana Row and others, dated 25th July 1906.

Endorsement to the Superintending Engineer, II Circle, No. 2765, dated 28th July 1906.

"	"	II	"	" 2808	"	1st Aug.	"
"	"	II	"	" 2890	"	8th "	"

II

Letter—from A. C. LANGSTON, Esq., A.M.I.C.E., Superintending Engineer, II Circle.
To—the Chief Engineer for Irrigation.
Dated—Bezwada, the 19th August 1906.
No.—249-I.

With reference to the following petitions received from you with Nos. 7953, dated 23rd July 1906, 3945, dated 24th July 1906, 8045, dated 26th July 1906, 4147, dated 2nd August 1906, and in reply thereto, I have the honour to enclose letter No. 249-S.E./49-M., dated 30th July 1906, from the Executive Engineer, Kistna Central division (in original) for information and *the favour of return.* This letter explains the whole cause of the complaint. Mr. Brown has only been trying to carry out the Collector's orders to stop bathing and washing clothes at the particular steps mentioned by Collector which are more immediately under the charge of this department, but not from taking water for drinking purposes lower down the canal, at the wharf for instance where a policeman is always supposed to be.

2. This same letter states that one P. Virayya, B.A., B.L., intends to bring a suit against Mr. Brown under the circumstances therein detailed, and Mr. Brown asks that sanction to defend the suit at the expense of Government may be obtained under paragraph 408, Public Works Department Code.

Information has not yet been received that a suit has *been actually* filed and until it is filed there seems to be no need to apply to Government.

The petitions referred to are returned herewith.

Enclosures.

Letter—from M. Brown, Esq., Executive Engineer, Kistna Central Division.
To—the Collector of Kistna.
Dated—the 30th July 1906.
No.—769 M./49 M.

I have the honour to enclose copies of letters from my lock superintendent and one Virayya, B.A., B.L., also references to your No. 1805-G.L., dated 7th May 1906, on the subject of stopping bathing and washing at the head of the canals.

2. With reference to the frivolous and vexatious complaint to be filed by Mr. Virayya, I have the honour to request, with reference to Standing Order No. 830/89 to paragraph 408 of Madras Public Works Department Code, you will sanction my obtaining advice thereon from the Government Pleader, Bezwada.

I am, through the Superintending Engineer, Kistna district, which, I believe, is the correct procedure, obtaining sanction to Government defending the suit.

3. The steps in question are those adjoining the lock channel and leading from the canal to the Public Works Department shops, stores, quarry compound and Sub-division office.

4. During the last visit of the Sanitary Commissioner, the Police of their own accord kept these steps free of people. After the subsidence of cholera subsequent to Sanitary Commissioner's visit, I allowed people to draw water at these steps until cholera again broke out. I then had to stop the people from drawing water or drinking at these Government steps for the reason that they continually brought filthy cloths with them, sometimes concealed, while going down the steps and washed them in this canal that supplies drinking water to Masulipatam and the delta.

5. I do not consider that these steps are public property any more than the head sluice platform is.

No. 249-S.E./49-M., dated 30th July 1906.

Forwarded to the Superintending Engineer, II Circle, with the request that he will be so kind as to ask Secretary to Government, Public Works Department, to sanction the defence of this suit at Government expense when it is filed. Something must be done shortly to keep the people from loafing on Government works, I have myself to repeatedly turn people off the head sluice platform and approach to the shops, and the late Superintending Engineer had to turn back a Muhammadan procession from proceeding along the river wall road.

M. Brown,
Ex. Engr., Kistna Central Divn.

Letter—from M.R.Ry. M. Venkiah, Lock Superintendent, Bezwada.
To—the Executive Engineer, Kistna Central Division.
Dated—the 18th July 1906.
No.—6.

I beg to report that under your orders a lascar is always kept on the main canal near steps to prevent men from getting down the canal, etc.

This evening Lascar M. Hanumanthu was on duty. Two or three men while getting down the steps, the lascar told them that they should not get down. They did not care for the lascar, when he came and told me the fact; I at once went to the spot and found three men sitting; I requested them in polite terms that they should not sit down here. One of them questioned me who I was; I replied that I am the lock superintendent, Bezwada, and that my name is M. Venkiah; when I asked for his name, he did not reply nor did he leave the place; on which I told the men that I would report their conduct to the Executive Engineer, to which they replied that I might do so. I at once came and reported to your honour in person and before I came out of your honour's office room these men left the place immediately. I hastened to them and found out one of the man's name to be Mr. Peddibhotla Virayya Pantulu, B.A., B.L. This I told your honour, so I beg to bring this to your honour's notice formally.

Letter—from M.R.Ry. P. Virayya Pantulu, B.A., B.L., Pleader, Bezwada.
To—the Executive Engineer, Kistna Central Division, Bezwada.
Dated—the 20th July 1906.

Whereas your servant Maganti Hanumanthu purporting to act under your orders wrongfully restrained me from getting down the steps near the head sluice of the canal close by the Workshop and from taking the water in the canal to which I have every right, I hereby give you notice, under section 424 of the Civil Procedure Code, that I intend filing a suit against you for damages for the injury caused to me at your instance, and the cause of action to me arose at Bezwada on 18th July 1906 within the jurisdiction of the District Munsif's Court, Bezwada, and the amount of damages I seek to recover from you is Rs. 50. The name and abode of the intending plaintiff are Peddhibotla Virayya B.A., B.L., and Buckinghampeta, Bezwada, respectively.

No. 1068 I., 12th OCTOBER 1906.

Letter—from the Collector of Kistna.
To—the Sanitary Commissioner (communicated to Head Assistant Collector, Bezwada, Chairman, Municipal Council, Executive Engineer, Kistna Central Division).
Dated—the 7th May 1906.
No.—1805-Gl.

In reply to your No. 1282-S., dated 2nd May 1906, I have the honour to state that it is not possible, nor in my opinion is it advisable, to prevent the washing of clothes and bathing in the river at Bezwada.

2. I am asking the Head Assistant Magistrate, the Executive Engineer, Kistna Central Division, the District Superintendent of Police and the Chairman, Municipal Council, to check the spread of cholera in Bezwada by preventing (1) the washing of clothes and bathing in the canals and (2) the use of river and canal banks as places of easement.

Memo.

The Police Inspector, Bezwada, is requested to depute two constables to help in the conservancy of the drinking water-supply during the prevalence of cholera. One constable will be required to patrol from the head works to the railway bridge over the main canal, and the other along the Bundar canal up to the municipal limits.

All persons entering the water or defiling the banks in any way should be most strictly prosecuted.

H. H. BURKITT,
Ag. Head Assistant Magistrate.

15*th March* 1906.

Dis. No. 99-*Mag., dated* 15*th March* 1906.

Forwarded to the Executive Engineer, Kistna Central division, for information.

H. H. BURKITT,
Ag. Head Assistant Magistrate.

Letter—from M. BROWN, Esq., Executive Engineer, Kistna Central Division.
To—the Head Assistant Collector, Bezwada.
Dated—the 19th January 1906.
No.—31.

I have the honour to inform you that the people of Bezwada town are bathing and washing clothes on the steps on the north and south banks of main canal below head sluice. The steps are being damaged and much refuse and rubbish is brought there by them. To prevent this being done, I intend fixing two boards at the top of the steps with the following inscription:—

"Bathing and washing clothes are prohibited".

Under these circumstances, I have the honour to request you will kindly let me know your views on the subject and if I may prosecute those who act contrary to the above notice.

During the Sanitary Commissioner's visit to Bezwada in January 1906, the police of their own accord prevented this bathing and washing.

Letter—from E. S. LLOYD, Esq., I.C.S., Acting Sub-Collector, Bezwada Division.
To—the Executive Engineer, Kistna Central Division, Bezwada.
Dated—the 9th February 1906.
No.—Dis. 211 D.-Gl.

In reply to your letter No. 31, dated 19th January 1906, I have the honour to inform you that I have no objection to the proposal made by you for fixing two boards at the top of the steps on the north and south banks of the main canal below the head sluice in Bezwada town and warning the people not to bathe and wash their clothes in the canal.

The Police Inspector has been asked to enforce the prohibition.

III

Petition from V. Gopalakrishnamoorthy, townsman of Bezwada, dated 18th August 1906.

Telegram from A. Kalla Venkayya, President, Public Meeting, Bezwada, dated 9th September 1906, praying for the cancellation of the orders of Mr. Brown.

Memorial from the townsmen of Bezwada assembled at a public meeting, dated 16th September 1906.

Order—No. 1068 I., dated 12th October 1906.

The papers read above relate to the petitions and telegrams received from the people of Bezwada complaining of the action of Mr. Brown, Executive Engineer, Kistna Central division, in having prevented them from the use of the Kistna main canal steps for the purpose of drawing water and washing clothes.

2. It is understood from the enclosure to letter No. 249 I., dated 19th August 1906, from the Superintending Engineer, II Circle, quoted above that during a recent outbreak of cholera the Sanitary Commissioner drew attention to the necessity for preventing bathing and washing in the canals and the use of river and canal banks as latrines. The Executive Engineer finding that the people who had been hitherto allowed to use the steps leading down to the canal for the purpose of drawing water for domestic use could not otherwise be prevented from also bathing and washing clothes then prevented them from using the steps at all.

3. The restrictions imposed by the Executive Engineer are considered desirable in the interests of the public health of Bezwada and His Excellency the Governor in Council sees no reason to interfere in the matter.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Superintending Engineer, II Circle.
" Petitioners, through the Superintending Engineer, II Circle.
" Chief Engineer for Irrigation.
" Local and Municipal Department.

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	} 1906.		*Enclosures*
Regd.			*Spare copies*

G.O., No. 1070 I., 13th October 1906.

Motor Launch for use on the Kistna river

Correspondence in connection with the construction of a —, communicated to the officers concerned, and the Director, Royal Indian Marine Dockyard, Bombay, ordered to be requested to arrange for the construction of the launch.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.

Read—the following papers :—

I

G.O., Nos. 504–505 I., dated 11th May 1906.
„ „ 766–767 I. „ 16th July „
„ No. 898 I., dated 22nd August 1906.

II

Letter—from Captain F. H. Elderton, d.s.o., R.I.M., Officiating Deputy Director of the Royal Indian Marine.
To—the Joint Secretary to the Government of Madras, Public Works Department (Irrigation Branch).
Dated—Calcutta, the 5th September 1906.
No.—3404.

In reply to your letter No. 767 I., dated the 16th July 1906, I have the honour to enclose herewith a sketch of a twin screw motor launch 60′ × 10′ on 3 feet draught of water, prepared in accordance with your letter.

2. It is considered that each engine should have a B.H.P. of 72, and the cost of two such with starting engines will be £1,700 or Rs. 25,500. The engines would have to be obtained by indent on the Secretary of State, and if the boat is to be built, this indent should be forwarded through the Government of Madras, there being no funds in the Royal Indian Marine budget to meet the cost.

3. Oil stowage of 800 gallons has been provided for on the draught of water, which will suffice for 44 hours' consumption at full speed of 12½ miles per hour.

4. The total estimated cost will be Rs. 36,000 and the launch can be built in about six months from date of order, but this will depend on the delivery of the engines.

The freight to Masulipatam will be about Rs. 1,000 in addition to the above estimate.

III

Letter—from Captain W. Chandler, R.I.M., Officiating Director of the Royal Indian Marine.
To—the Secretary to the Government of Madras, Public Works Department (Irrigation Branch).
Dated—Bombay, the 21st September 1906.
No.—5350.

With reference to correspondence ending with your letter No. 898 I., dated 22nd August 1906, I have the honour to forward herewith for your approval an outline design, prepared in accordance with your instructions, of a motor launch required for use on the Kistna river and canals.

I would observe that a 110 B.H.P. motor is still considered necessary to meet the requirements specified, even with the modifications made, as Messrs. Thornycroft write about these motors: "With paraffin they give about two-thirds the power developed with petrol, so the speed will be correspondingly reduced", and as their price in England for a motor of this size is *£1,070* without extras, the boat complete could not be supplied under Rs. 30,000 approximately.

The launch could be completed in about two months after the motor is received.

IV

Telegram—from the Joint Secretary to the Government of Madras, Public Works Department (Irrigation Branch).

To—the Secretary to the Government of India, Public Works Department.

Dated—the 6th October 1906.

No.—419-O.

Your No. 814 I., dated 12th June 1906. Bombay dockyard has prepared suitable design meeting your objections to that originally submitted. Approximate cost including Thornycroft Motor Rs. 32,000. To avoid lapse of grant propose placing order with Bombay at once. Please wire approval.

V

Telegram—from the Secretary to the Government of India, Public Works Department.

To—the Joint Secretary to the Government of Madras, Public Works Department (Irrigation Branch).

Dated—Simla, the 10th October 1906.

No.—1481-W.

Your telegram sixth instant. Construction motor launch at Bombay dockyard, approximate cost Rs. 32,000, sanctioned.

VI

Specification for Motor Launch for Kistna River Conservancy.

General Dimensions.—Length 60 feet. Breadth 9 feet. Depth 5 feet 6 inches.

General arrangement.—The launch will contain a saloon, lavatory, motor room, cook's galley and after-cockpit in the order named.

Saloon.—The saloon will be 10′ long by an average width of 6′ 6″ and will be entered by a ladder leading on to the fore peak. It will be built of teak with a double roof with air space between. Windows will be venetianed. It will be unfurnished except for shelves to be fitted on the bulk heads.

Lavatory.—The lavatory will be 2′ 9″ wide and will be entered from the cabin by a door of the same width fastening back so as to shut off the water-closet. A shuttered opening 1′ 6″ × 1′ 6″ will be provided in the after bulk head above deck level, so that articles can be handed through into the saloon when the water-closet is shut off.

Steering wheel.—The steering wheel will be immediately behind the lavatory as shown in the plan sent with letter No. 5350, dated 21st September 1906, of the Director of the Royal Indian Marine.

Fuel tank.—The fuel tank of 100 gallons capacity should, if possible, be placed so as not to occupy so much of the launch's length as is shown in the above plan or two smaller tanks each of 50 gallons capacity may be provided and placed, longitudinally on either side of the engine room.

Motor room.—The motor room will be as shown in the above plan.

Cook's galley.—The cook's galley will be placed on the lower deck in the space immediately above which it is shown; in the above-mentioned plan one of the ladders from the cockpit and half the width of the launch may also be added to it and screened off by a partition; the centre (4′ 6″) should not be decked in but only the ends (2′) and cup boards should be provided with locked shutters in these portions.

After-cockpit.—Except so far as the alterations in the length of the saloon and in the cook's galley necessitate it, the after-cockpit will be designed as shown in the plan above quoted, the roof being strong enough to carry weight, say, of a crowd of people.

Hull scantlings.—As the boat will at times be used in salt water the hull will be of galvanized steel of the best quality, the bottom plates $\frac{3}{16}$″ thick and bilge and sides $\frac{1}{8}$″ thick.

R frame $1\frac{1}{4} \times 1\frac{1}{4} \times \frac{3}{16}$″
Frame $1\frac{1}{2} \times 1\frac{1}{2} \times \frac{3}{16}$″
Bar keel 3″ $\times \frac{1}{2}$″
Keelson 3″ × 3″ $\times \frac{5}{16}$″
Sister keelsons 3″ × 3″ $\times \frac{3}{8}$″
F plate 6″

These dimensions have been taken from the design for a launch for the Bombay customs service forwarded with the letter No. 4405, dated 26th July 1906, of the Director, Royal Indian Marine. It is desired that the launch may be built equally strong as the above.

Speed.—Speed to be at least 11 miles an hour using kerosine oil with moderate depth say six feet of water.

Draught.—Maximum draught not to exceed 3 feet.

Motor.—Motor to be of Messrs. Thornycroft's latest design to develop 110 brake horse power and propel the launch at the above speed of 11 miles an hour using kerosine oil.

Accessories.—The following accessories will be provided :—

Tinoleum flooring for saloon and lavatory floors.
Awning (removeable) on fore peak.
Lavatory fittings.
Tiller.
Bollards.
Fairleads.
Chainpipe and chain.
Awning stanchions.
Hand bilge pump.
Galley stove and funnel.
Fuel tank and fittings and connections.
Fenders.
Flagstaff.
Grating aft.
Copper side and mast head lamps.
Head and stern ropes.
Anchor and chain.

When not otherwise specified the launch will be according to the plan (blue print) received from the Royal Indian Marine Dockyard, Bombay, dated 18th September 1906.

4th October 1906.

C. A. SMITH,
Ag. Chief Engineer for Irrigation.

Order—No. 1070 I., dated 13th October 1906.

Communicated to the officers concerned with reference to G.O., No. 504 I., dated 11th May 1906.

2. The Director, Royal Indian Marine Dockyard, Bombay, will be requested to arrange for the construction of a motor launch in accordance with the design received with his letter No. 5350, dated 21st September 1906, subject to the modifications provided in the detailed specification prepared by the Chief Engineer for Irrigation.

3. The sanction accorded by the Government of India in their telegram read above is registered as No. 161 I. of 1906–1907 and will expire on 31st March 1907.

4. The following letter will be sent.

[Here enter No. 1071 I., dated 13th October 1906.]

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.
" General Superintendent, Public Works Workshops.

IRRIGATION.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. }1906. *Enclosures*

Regd. *Spare copies*

Letter, No. 1071 I., 13th October 1906.

Motor Launch for use on the Kistna river

Requesting, with remarks, to put in hand at once the construction of a — and to report the probable expenditure on the launch during the current official year.

PUBLIC WORKS DEPARTMENT.

Irrigation.

LETTER—from

C. A. SMITH, ESQ.,
Ag. Joint Secretary to the Government of Madras,
Public Works Department
(Irrigation Branch),

To

THE OFFICIATING DIRECTOR,
ROYAL INDIAN MARINE DOCKYARD,
Bombay.

SIR,

With reference to your letter No. 5350, dated 21st September 1906, I am directed to request that you will be good enough to put in hand at once the construction of a motor launch in accordance with the plan (blue print, dated 18th September 1906) sent with your letter under reply, except for the modifications provided in the enclosed detailed specification which, I am to request, may be followed.

2. I shall be obliged by your letting me know as soon as possible the probable expenditure on the launch during the current official year so that necessary arrangements for funds may be made.

I have the honour to be,
Sir,
Your most obedient servant,

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

OOTACAMUND,
13*th October* 1906.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*
Regd.		*Spare copies*

G.O., Nos. 1077, 1078 I., 18th October 1906.

Sluices in the Mulliyar, Cauvery Delta System

Forwarding a copy of the Proceedings sanctioning an estimate, amounting to Rs. 6,642, for providing screw-gearing shutters to 36 — from the head to the 15th mile.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

From the Superintending Engineer, V Circle, dated	14th July	1906,	No.	315-E.I.
To the „ „ „	15th Aug.	„	„	2949.
From the „ „ „	19th Sept.	„	„	422-E.I.

ENCLOSURE.

Report to accompany the estimate for providing screw-gearing shutters to the sluices in the Mulliyar from the head to the 15th mile.

	RS
Amount of estimate	5,400

The rivers Mulliyar and Iyanar are both branches from Corayar river branching at the 76th mile and they run for the first 5 miles in parallel lines to meet again and thence flow into one river by the name of Mulliyar. The ayacut under the Mulliyar and Iyanar taken together is 37,648 acres, of which 3,079 acres from the ayacut under the Iyanar alone.

2. Of the numerous offtakes from the Mulliyar constructed for the irrigation along its course, Adappar which takes off from 4/7 mile of the river forms the main branch having an independent ayacut of 13,448 acres. It intercepts a large amount of drainage from the Harichandranadi and the Mulliyar in its lower reaches, and develops into a big drainage, eventually falling into the sea at Thoputhurai near Védáranniyam. A branch from the Adappar 9th mile is connected with the Mulliyar by the name Menachivoikal and it supplements to the Mulliyar irrigation for the lower reaches below the 15th mile for about 7,661 acres.

3. The irrigation under the Mulliyar below the 9th mile has not been efficiently conducted, partly owing to the insufficient capacity of the head* sluice at the Corayar dam and partly owing to numerous offtakes at the higher reaches not being provided with effective arrangements for regulation.

* A new head sluice has been sanctioned and is under construction.

4. To remove the complaints from the lower ryots of defective supply, a turn of 3 days for the lower irrigation has been instituted, during which period it has been customary to close all the offtakes in the Mulliyar and the Iyanar up to the 9th mile including the main branch Adappar and the turn days are arranged so as to suit to the Vennar morai at the Grand Anicut. The interested mirasidars at the lower irrigation have to undertake the business of closing the offtakes in the higher reaches and they do this with much reluctance and expense, on all turn days, by putting down needle shutters wherever available and with bamboo sticks, straw and mud in the interstices to prevent the leakage. Some of the needle shutters in use are too big to be easily handled and are often damaged by rough usuage. After all, the sluices are not closed water-tight.

5. To facilitate however the closure of these sluices an estimate for Rs. 1050 has been sanctioned providing needle shutters and other sundry repairs. But this estimate is kept in abeyance by order of the Executive Engineer pending the proposal to substitute screw-gearing shutters. The utility of providing screw-gearing shutters to obviate the irksome system of regulating by needle shutters described above is very great, especially during turn days when the closure of all the sluices is required within a very short time. This estimate provides screw-gearing to the sluices and other sundry repairs required for them. The estimate for Rs. 1,050 already sanctioned may be cancelled when sanctioning the enclosed estimate which amounts to Rs. 5,400.

6. No alterations in the sizes and sill levels of the sluices are proposed, as any step in that direction will create law suits and troubles.

7. An estimate for enlarging the head sluice to the Mulliyar has been sanctioned and the work is already commenced. It is expected that the Mulliyar will bring down enough of supply to irrigate the ayacut at the tail-end without being supplemented by the water of Iyanar or the Menachivoikal.

8. Hydraulic details are given in the plans that accompany the estimate.

9. All works will be carried out as per standard specification current in the department.

S. Sambasiva Aiyar,
Sub-Divisional Officer.

10*th March* 1906.

U. S. Ramaswami Aiyar,
Offg. Executive Engineer.

Note.—The rates for brickwork and concrete would appear to be rather high but considering the small quantity required for each sluice and the cost of conveyance of materials from the place of manufacture and distribution to the respective work sites the rate is proper and adequate.

II

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, V Circle, submits an estimate, amounting to Rs. 5 400, for providing screw-gearing shutters for 36 existing sluices along the Mulliyar from its head to the 15th mile, Cauvery Delta system. It is stated that owing to the insufficient capacity of the Mulliyar head sluice at the Corayar dam and to the unsatisfactory condition of the present regulating sluices in the portion of the river above referred to, the irrigation of the lands lower down could not be efficiently carried on. The necessary improvements to the head sluice are being executed under the estimate sanctioned in G.O., No. 1123 I., dated 16th November 1905, and those now proposed are intended to render the regulating sluices more efficient.

2. Provision for widening the Mulliyar and reconstructing the sluices along its course has been made in the estimate for the Cauvery Reservoir Project which was submitted to the Government of India with letter No. 597 I., dated 1st June 1906. As it will, however, take some years for the above project to be completed and as the works now proposed are considered urgently necessary in the interests of irrigation, the estimate received from the Superintending Engineer is recommended for sanction. The shutters now proposed to be fitted to the sluices can be utilised as far as practicable in the reconstruction of the sluices provided for in the estimate for the Cauvery reservoir project when this scheme is sanctioned and taken up for execution.

3. It was stated in paragraph 1 of the report accompanying the estimate that the ayacut under the Mulliyar and Iyanar taken together was 24,200 acres, but, as the ayacut under the Adappar which is a branch of the Mulliyar has also to be taken into account, the above figure has now been increased to 37,648 acres as shown in the margin.

	ACRES.
Mulliyar	21,121
Adappar	13,448
Iyanar	3,079
Total ...	37,648

4. The work is classed as "unremunerative" and will probably be completed by 31st March 1908.

C. A. Smith,
Ag. Chief Engineer for Irrigation.

8*th October* 1906.

Order—No. 1077 I., dated 18th October 1906.

The following estimate is sanctioned :—

Imperial.
Capital Expenditure not charged to Revenue.
49. Irrigation.
Cauvery Delta System.
Negapatam Division.
Open Capital Account.
I. Works.
3. Distributaries.
C. Works.
Unremunerative Work.

Providing screw-gearing shutters for 36 sluices in the Mulliyar from the head to the 15th mile.

	RS.
Estimate—	
I. Works ...	5,400
II. Establishment ...	1,242
Total ...	6,642

2. This sanction is registered as No. 162-I. of 1906–1907, and will expire on 31st March 1908.

3. The attention of the Superintending Engineer, V Circle, is drawn to the concluding portion of paragraph 1 of the foregoing note by the Chief Engineer for Irrigation.

4. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 1078 I., dated 18th October 1906.]

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, V Circle, with plans and estimate.
,, Examiner, Public Works Accounts.

Endorsement—No. 1078 I., dated 18th October 1906.

Forwarded.

(By order.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., Nos. 1079, 1080 I., 19th October 1906.

Financial results of Irrigation and Navigation Works during 1905–1906

Forwarding a copy of the Proceedings on the statements showing the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

Letter—from R. SRINIVASA IYER, Esq., Offg. Examiner, Public Works Accounts, Madras and Coorg.
To—the Chief Engineer for Irrigation.
Dated—Madras, the 11th October 1906.
No.—5122 B./Bk.

Herewith the statements showing the financial results of Irrigation and Navigation works during 1905–1906 for submission to the Government of India.

2. Entries in columns 2 and 3, and those for the Kurnool-Cuddapah canal under columns 16 to 20 of table I, have not been filled in, as information regarding mileage in operation and of the area irrigated is not available in this office.

Enclosures.

Statement showing the Financial Results of the Irrigation Works in the Madras Presidency for, and up to end of, 1905–1906.

Table I.—Principal Results of Operation for the year ending 31st March 1906.

Irrigation Works.	Mileage in operation.		Direct capital outlay during the year 1905–1906 (including cost of establishment and tools and plant).	Gross receipts, direct and indirect, from all sources.	Working expenses.			Net revenue (excluding charges for interest).		Interest at 4 per cent. on direct capital outlay to end of 31st March 1900 and at 3¾ per cent. on the outlay from that date to end of previous year *plus* half the outlay of the year.
	Main canal.	Distributaries.			Direct.	Indirect.	Total.	Amount.	Percentage on total direct, and indirect, capital outlay.	
1	2	3	4	5	6	7	8	9	10	11
MAJOR WORKS.	MILES.	MILES.	RS.	RS.	RS.	RS.	RS.	RS.		RS.
Productive Public Works.										
Irrigation Works.										
Gódávari delta system	503	1,964	2,07,048	37,19,590	9,33,097	39,255	9,72,352	27,47,238	19·75	4,72,966
Kistna do.	379	2,030	73,340	31,91,067	8,36,061	36,063	8,72,124	23,18,943	15·05	5,70,609
Cauvery do.	844	1,250	1,68,032	9,79,331	1,16,764	7,626	1,24,390	8,54,941	24·82	1,25,418
Pennér river canal system	31	467	36,552	4,48,245	1,09,129	7,168	1,16,297	3,32,948	5·14	2,17,720
Srivaikuntam anicut	28	62	21,225	1,26,956	17,432	1,117	18,549	1,08,407	6·70	59,890
Kurnool-Cuddapah canal	190	315½	69,631	2,04,125	85,109	3,331	88,440	1,15,685	·53	8,71,895
Barur tank project	7	21½	222	12,536	7,377	254	7,631	4,905	1·13	16,451
Peryar project	36	240	1,52,862	5,12,954	1,22,518	4,352	1,26,865	3,86,089	4·06	3,61,988
Nagavalli river project	..	..	1,87,835	..	..	..	..	..	..	3,522
Divi Pumping project	..	..	3,69,525	..	..	..	..	..	..	6,929
Total ..	2,018	6,350	12,86,272	91,95,804	22,27,482	99,166	23,26,648	68,69,156	9·38	27,07,388
Protective Works.										
Rushikulya project	80	136	33,025	1,12,064	53,247	1,176	54,423	57,641	1·14	1,83,981
Mopad reservoir project	..	..	2,31,752	..	..	..	..	..	..	4,411
Total ..	80	136	2,64,777	1,12,064	53,247	1,176	54,423	57,641	1·09	1,88,392
MINOR WORKS AND NAVIGATION.										
Irrigation Works.										
Chembrambakam tank	27	..	— 2,977	16,562	8,374	195	8,569	7,993	1·07	25,331
Pálár anicut	163	133	— 6,925	1,59,117	3,15,937	8,161	3,24,098	—1,64,981	(*a*)	89,076
Pelandorai anicut	39	24	..	38,908	12,900	286	13,186	25,717	4·32	21,960
Madras Water-supply and irrigation extension project ..	10	..	— 248	35,112	7,990	462	8,452	26,660	1·50	61,321
Lower Coleroon anicut	350	648	28,444	2,89,004	79,167	2,175	81,342	2,07,862	14·47	54,339
Shatiatope do.	41	149	17,949	1,10,054	31,323	724	32,047	78,007	18·92	15,401
Vriddhachalam do.	33	16	..	21,652	6,983	155	7,138	14,514	19·12	2,898
Mehamattur do.	15	9	10	12,893	4,257	95	4,352	8,541	11·77	2,826
Tirrukkoyilúr do.	137	26	26,252	42,814	45,408	1,151	46,559	— 3,745	(*a*)	12,474

(*a*) No percentages have been calculated as the net revenue in these cases are *minus* figures.

Table I.—Principal Results of Operation for the year ending 31st March 1906—*cont.*

Irrigation Works.	Surplus revenue after paying interest on direct capital outlay.		Excess charge including interest on direct capital outlay.		Area of land irrigated during the year.			Gross receipts per acre irrigated due to new works.	Working expenses (excluding interest) per acre irrigated due to new works.	Percentage of working expenses on receipts.
	Amount.	Percentage on capital outlay.	Amount.	Percentage on capital outlay.	Due to old irrigation works.	Due to new irrigation works.	Total.			
	12	13	14	15	16	17	18	19	20	21
MAJOR WORKS.	RS.		RS.		ACS.	ACS.	ACS.			
PRODUCTIVE PUBLIC WORKS.										
Irrigation Works.										
Gódávari delta system	22,74,272	16·35	..	..	151,836	763,481	915,317	4·87	1·27	26·14
Kistna do.	17,48,334	11·35	..	..	70,903	588,295	659,198	5·42	1·48	27·33
Cauvery do.	7,29,523	21·18	..	..	779,641	213,975	993,616	4·58	·58	12·70
Pennér river canal system	1,15,228	1·78	..	..	100,611	74,788	175,399	6·01	1·56	25·89
Srívaikuntam anicut	48,517	3·00	..	..	20,521	23,437	43,958	5·42	·79	14·61
Kurnool-Cuddapah canal	..	..	7,56,210	3·46	..	62,337	62,337	3·28	1·42	43·33
Barur tank project	..	..	11,546	2·65	1,809	3,738	5,547	3·35	2·04	6·087
Periyár project	24,101	·26	..	..	80,965	78,561	159,526	6·53	1·61	24·73
Nagavalli river project	..	..	3,522	1·86	..	..	..	..	..	..
Divi Pumping project	..	..	6,929	1·85	..	..	..	..	..	..
Total ..	41,61,768	5·69	..	..	1,206,286	1,808,612	3,014,898	5·08	1·28	25·30
PROTECTIVE WORKS.										
Rushikulya project	..	..	1,26,340	2·51	57,284	44,960	102,244	2·49	1·21	48·56
Mopad reservoir project	..	..	4,411	1·85	..	..	..	..	..	..
Total ..	..	..	1,30,751	2·48	57,284	44,960	102,244	2·49	1·21	48·56
MINOR WORKS AND NAVIGATION.										
IRRIGATION WORKS.										
Chembrambakam tank	..	..	17,338	2·33	12,468	731	13,199	22·66	11·72	51·74
Pálár anicut	..	..	2,54,057	10·79	68,719	32,005	100,724	4·97	10·13	203·68
Pelandorai anicut	3,757	·63	..	..	2,214	9,116	11,330	4·27	1·45	33·89
Madras Water-supply and irrigation extension project ..	..	..	34,661	1·96	6,445	3,448	9,893	10·18	2·45	24·07
Lower Coleroon anicut	1,53,323	10·69	..	..	44,914	66,400	111,314	4·35	1·23	28·15
Shatiatope do.	62,606	15·19	..	..	7,109	28,606	35,715	3·85	1·12	29·12
Vriddhachalam do.	11,616	15·30	..	..	2,412	5,648	8,060	3·83	1·26	32·97
Mohamattur do.	5,715	7·87	..	..	991	3,165	4,156	4·07	1·37	33·75
Tirukkóyilúr do.	..	..	16,219	4·81	16,017	12,654	28,671	3·38	3·68	108·75

Table I.—Principal Results of Operation for the year ending 31st March 1906—*cont.*

Irigation Works.	Mileage in operation.		Direct capital outlay during the year 1905-1906 (including cost of establishment and tools and plant).	Gross receipts, direct and indirect, from all sources.	Working expenses.			Net revenue (excluding charges for interest.)		Interest at 4 per cent. on direct capital outlay to end of 31st March 1900 and at $3\frac{3}{4}$ per cent. on the outlay from that date to end of previous year *plus* half the outlay of the year.
	Main canal.	Distributaries.			Direct.	Indirect.	Total.	Amount.	Percentage on total direct, and indirect, capital outlay.	
1	2	3	4	5	6	7	8	9	10	11
MINOR WORKS AND NAVIGATION—*cont.*	MILES.	MILES.	RS.	RS.	RS.	RS.	RS.	RS.		RS.
IRRIGATION WORKS—*cont.*										
Cumbum tank	..	24	7,853	— 72	1,407	22	1,429	— 1,501	(*a*)	2,728
Valluru anicut	3	8	..	2,351	1,201	29	1,230	1,121	1·72	2,545
Marudur do.	27	45	779	73,356	3,290	— 28	3,262	70,094	145·30	1,859
Thadapalle channel	76	..	7,271	42,886	12,234	273	12,507	30,379	18·46	5,933
Arkenkota do.	24	..	761	10,118	4,781	112	4,893	5,225	3·72	5,363
Kalingaroyen do.	61	..	— 10	25,411	6,467	141	6,608	18,803	12·04	5,932
Cheyar anicut	61	120	..	45,821	21,356	507	21,863	23,958	5·81	16,023
Poiney do.	104	78	..	46,079	18,994	552	19,546	26,583	11·23	9,197
Dondapad tank	..	7	3,197	111	577	16	593	— 482	(*a*)	4,949
Sagileru project	14	..	6,640	3,790	6,015	149	6,164	— 2,374	(*a*)	17,733
Muniyeru do.	$50\frac{3}{4}$	$6\frac{1}{2}$	— 1,414	7,969	7,610	190	7,800	169	·03	22,432
Nandiyar channel extension	24	..	..	3,159	2,531	60	2,591	568	·96	2,260
Ganjám minor river system	100	..	3,298	54,651	45,355	1,106	46,461	8,190	3·28	9,246
Chopad project	..	..	6,314	..	1,138	24	1,162	— 1,162	(*a*)	20,130
Ponnalur tank	..	..	15,678	..	..	..	..	..	..	5,024
Hajipuram do.	..	..	1,25,537	..	..	..	..	..	..	5,642
Atmakur project	..	..	19,033	..	..	..	..	..	..	3,423
Vamulla do.	..	..	..	..	335	5	340	— 340	(*a*)	2,332
Jangamaheswarapuram tank	..	..	2,758	..	15	..	15	— 15	(*a*)	2,128
Yerur tank	..	..	14,785	..	..	..	..	..	..	1,913
Anamasamudram Bisaperu channel		..	42,836	..	..	..	..	..	..	803
Total, Irrigation ..	$1,359\frac{3}{4}$	$1,193\frac{1}{2}$	3,17,821	10,41,741	6,45,645	16,562	6,62,207	3,79,534	3·19	4,33,221
NAVIGATION WORKS.										
Buckingham canal	262	..	— 284	65,568	90,449	2,973	93,422	— 27,854	(*a*)	3,41,056
Chilka lake do.	8	..	..	..	330	9	339	— 339	(*a*)	1,210
Ganjám-Gopalpur canal	11	..	..	26	381	10	391	— 365	(*a*)	5,724
Vedaranniyam canal	$34\frac{1}{2}$	..	..	1,112	8,963	241	9,204	— 8,092	(*a*)	5,308
Total, Navigation ..	$315\frac{1}{2}$	..	— 284	66,706	1,00,123	3,233	1,03,356	— 36,650	..	3,53,298
Total, Minor Works and Navigation ..	$1,675\frac{1}{4}$	$1,193\frac{1}{2}$	3,17,537	11,08,447	7,45,768	19,795	7,65,563	3,42,884	1·61	7,86,519

(*a*) No percentages have been calculated as the net revenue in these cases are *minus* figures.

Table I.—Principal Results of Operation for the year ending 31st March 1906—*cont.*

Irrigation Works.	Surplus revenue after paying interest on direct capital outlay.		Excess charge including interest on direct capital outlay.		Area of land irrigated during the year.			Gross receipts per acre irrigated due to new works.	Working expenses (excluding interest) per acre irrigated due to new works.	Percentage of working expenses on receipts.
	Amount.	Percentage on capital outlay.	Amount.	Percentage on capital outlay.	Due to old irrigation works.	Due to new irrigation works.	Total.			
	12	13	14	15	16	17	18	19	20	21
MINOR WORKS AND NAVIGATION—*cont.*										
IRRIGATION WORKS—*cont.*	RS.		RS.		ACS.	ACS.	ACS.			
Cumbum tank	..	..	4,229	5·69	7,254	748	8,002	— ·10(*a*)	1·91	(*a*)
Valluru aniout	..	..	1,424	2·18	4,081	874	4,955	2·68	1·41	52·32
Marudur do.	68,235	141·44	..	..	17,498	16,829	34,327	4·36	·19	4·45
Thadapalle channel	24,446	14·86	..	..	10,092	6,060	16,152	7·08	2·06	29·16
Arkenkota do.	..	..	138	·10	2,743	1,603	4,346	6·31	3·05	48·36
Kalingaroyen channel	12,871	8·24	..	..	16,694	5,635	22,329	4·51	1·17	26·00
Cheyar aniout	7,935	1·93	..	..	16,437	17,547	33,984	2·61	1·25	47·71
Poiney do.	17,336	7·34	..	..	18,450	9,093	27,543	5·07	2·15	42·42
Dondapad tank	..	..	5,431	3·92	..	16	16	6·94	37·06	534·23
Sagileru project	..	..	20,107	4·33	4,932	1,141	6,073	3·32	5·40	162·64
Muniyeru do.	..	..	22,263	3·76	157	1,704	1,861	4·68	4·58	97·88
Nandiyar channel extension	..	..	1,692	2·87	5,981	1,126	7,107	2·81	2·30	82·02
Ganjám minor river system	..	..	1,056	·42	49,883	26,125	76,008	2·09	1·78	85·01
Chopad project	..	..	21,292	3·85	..	..	..	..	..	..
Ponnalur tank	..	..	5,024	3·09	..	..	..	..	..	..
Hajipuram do.	..	..	5,642	2·42	..	..	..	..	..	..
Atmakur project	..	..	3,423	3·02	..	..	..	..	..	..
Vamulla do.	..	..	2,672	4·19	..	..	..	..	..	..
Jangamahcswarapuram tank	..	..	2,143	3·13	..	..	..	..	..	..
Yerur tank	..	..	1,913	3·19	..	..	..	..	..	..
Anamasamudram Bisaperu channel	..	..	803	1·83	..	..	..	..	..	..
Total, Irrigation ..	..	..	53,687	·45	315,491	250,274	5,65,765	4·16	2·64	63·57
NAVIGATION WORKS.										
Buckingham canal	..	..	3,68,910	4·09	..	..	..	..	..	142·48
Chilka lake do.	..	..	1,549	4·99	..	..	..	..	..	..
Ganjám-Gopalpur canal	..	..	6,089	3·92	..	..	..	..	..	1,503·85
Vedaranniyam canal	..	..	13,400	9·84	..	..	..	..	..	827·70
Total, Navigation ..	..	..	3,89,948	4·17	..	..	..	..	..	154·94
Total, Minor Works and Navigation ..	..	..	4,43,635	2·09	315,491	250,274	5,65,765	4·43	3·06	69·06

(*a*) No percentages have been calculated as the revenue in this case is a minus figure.

TABLE II.—General Financial Results of the several undertakings to the 31st March 1906.

Irrigation works.	Estimated cost of construction (exclusive of all indirect charges).	Date of completion of work.	Capital outlay. Direct charges. To end of previous year.	Capital outlay. Direct charges. To end of year.	Capital outlay. Indirect charges. To end of year.	Capital outlay. Total capital outlay, both direct and indirect, to end of year.	Excess of interest over net revenue in past years.	Total sum at charge at end of 1905-1906.
1	2	3	4	5	6	7	8	9
MAJOR WORKS.	RS.		RS.	RS.	RS.	RS.	RS.	RS.
PRODUCTIVE PUBLIC WORKS.								
Irrigation Works.								
Gódávari delta system	1,22,66,636	1846–47	1,17,60,580	1,19,67,628	19,38,929	1,39,06,557	..	1,39,06,557
Kistna Do.	1,53,35,206	1855–56	1,43,33,481	1,44,06,821	10,03,191	1,54,10,012	..	1,54,10,012
Cauvery Do.	36,12,655	1836–37	31,17,029	32,85,061	1,60,110	34,45,171	..	34,45,171
Penner river canal system	55,40,307	1860–61	54,61,276	54,97,828	9,85,761	64,83,589	..	64,83,589
Srívaikuntam anicut system	15,82,210	1870–71	14,94,267	15,15,492	1,03,299	16,18,791	..	16,18,791
Kurnool-Cuddapah canal	2,20,79,674	1882–83	2,17,67,453	2,18,37,084	5,754	2,18,42,838	1,96,03,808	4,14,46,646
Barur tank project	4,12,675	1887–88	4,11,747	4,11,969	23,138	4,35,107	2,42,183	6,77,290
Periyár project	98,50,523	1895–97	90,09,369	91,62,231	3,35,909	94,98,140	22,61,602	1,17,59,742
Nagavalli river project	10,26,606	..	..	1,87,835	2,024	1,89,859		1,89,859
Divi pumping project	18,06,000	..	..	3,69,525	4,836	3,74,361	..	3,74,361
Total ..	7,35,12,492	..	6,73,55,202	6,86,41,474	45,62,961	7,32,04,425	2,21,07,593	9,53,12,018
PROTECTIVE WORKS.								
Rushikulya project	47,03,868	1891–92	45,99,565	46,32,590	4,09,077	50,41,667	20,93,764	71,35,431
Mopad reservoir project	11,36,000	..	1,747	2,33,499	4,760	2,38,259	33	2,38,292
Total ..	58,39,868	..	46,01,312	48,66,089	4,13,837	52,79,926	20,93,797	73,73,723
MINOR WORKS AND NAVIGATION.								
IRRIGATION WORKS.								
Chembrambakum tank	6,42,532	1870–71	6,34,679	6,31,702	1,12,350	7,44,052	..	7,44,052
Palar anicut	25,77,085	1853–54	22,46,948	22,40,023	1,14,648	23,54,671	9,06,241	32,60,912
Pelandorai anicut	5,53,490	1875–76	5,48,988	5,48,988	45,856	5,94,844	5,53,678	11,48,522
Madras water-supply and Irrigation extension project ..	15,34,058	1870–71	15,34,306	15,34,058	2,38,608	17,72,666	20,21,832	37,94,498
Lower Coleroon anicut	14,11,818	1848–49	13,61,290	13,89,734	44,892	14,34,626	..	14,34,626
Shatiatope anicut	4,40,808	1847–48	3,86,564	4,04,513	7,713	4,12,226	..	4,12,226
Vriddhachalam anicut	79,490	1868–69	73,890	73,890	2,010	75,900	..	75,900
Mehamattur Do.	70,761	1872–73	70,751	70,761	1,852	72,613	..	72,613
Tirukkóyilúr Do.	3,39,448	1861–62	3,02,366	3,28,618	8,265	3,36,883	..	3,36,883

Table II.—General Financial Results of the several undertakings to the 31st March 1906—*cont.*

Irrigation works.	Estimated cost of construction (exclusive of all interest charges).	Date of completion of work.	Capital outlay. Direct charges. To end of previous year.	Capital outlay. Direct charges. To end of year.	Capital outlay. Indirect charges. To end of year.	Capital outlay. Total capital outlay, both direct and indirect, to end of year.	Excess of interest over net revenue in past years.	Total sum at charge at end of 1905-1906.
1	2	3	4	5	6	7	8	9
MINOR WORKS AND NAVIGATION—*cont.*	RS.		RS.	RS.	RS.	RS.	RS.	RS.
IRRIGATION WORKS—*cont.*								
Cumbum tank	87,665	1876–77	64,532	72,385	1,919	74,304	..	74,304
Valluru anicut	66,588	1872–73	63,588	63,588	1,666	65,254	28,172	93,426
Maradur do.	47,967	1872–73	46,289	47,068	1,174	48,242	..	48,242
Thadapallo channel	1,59,257	1854–55	1,46,503	1,53,774	10,780	1,64,554	..	1,64,554
Arkenkota do.	1,36,693	1859–60	1,35,932	1,36,693	3,577	1,40,270	1,2 ,821	2,70,091
Kalingaroyen channel	1,52,198	1854–55	1,52,208	1,52,198	3,985	1,56,183	79,091	2,35,274
Cheyar anicut	4,02,515	1852–53	4,01,019	4,01,019	11,160	4,12,179	..	4,12,179
Poiney do.	2,30,105	1855–56	2,30,105	2,30,105	6,185	2,36,290	..	2,36,290
Dondapad tank	1,22,776	1898–99	1,20,765	1,23,962	14,714	1,38,676	55,220	1,93,896
Sagileru project	4,52,780	1898–99	4,40,299	4,46,939	17,615	4,64,554	1,78,858	6,43,412
Muniyeru do.	6,64,291	1898–99	5,63,463	5,62,049	29,471	5,91,520	1,66,843	7,58,363
Nandiyar channel extension	56,610	1895–96	56,610	56,610	2,300	58,910	35,014	93,924
Ganjám minor river system	2,10,520	1852–53	2,36,490	2,39,788	9,934	2,49,722	..	2,49,722
Chopad system	5,67,705	..	5,27,132	5,33,446	19,184	5,52,630	78,319	6,30,949
Ponnalur tank	1,25,400	..	1,26,139	1,41,817	20,908	1,62,725	7,166	1,69,891
Hajipuram project	2,81,300	..	87,689	2,13,226	19,915	2,33,141	2,146	2,35,287
Atmakur do.	1,11,931	..	81,755	1,00,788	12,565	1,13,353	3,201	1,16,554
Vemulla do.	57,400	..	62,186	62,186	1,571	63,757	3, 81	67,738
Jangamahesvarapuram tank	56,500	..	55,374	58,132	10,347	68,479	4,020	72,499
Yerur tank	58,764	..	43,615	58,400	1,529	59,929	1,740	61,669
Anamasamudram-Beraperu channel	64,286	..	..	42, 36	1,121	43,957	..	43,957
Total, Irrigation	1,17,62,691	..	1,08,01,475	1,11,19,296	7,77,814	1,18,97,110	42,55,343	1,61,52,453
NAVIGATION WORKS.								
Buckingham canal	85,44,585	1837–38	85,29,613	85,29,329	4,88,175	90,17,504	85,58,614	1,75,76,118
Chilka lake do.	30,240	..	30,240	30,240	787	31,027	43,549	74,576
Ganjám-Gopalpur canal	1,43,100	..	1,43,100	1,43,100	12,393	1,55,493	97,128	2,52,621
Védáranniyam canal	1,32,699	1874–75	1,32,699	1,32,699	3,474	1,36,173	2,87,051	4,23,224
Total, Navigation	88,50,624	..	88,35,652	88,35,368	5,04,829	93,40,197	89,86,342	1,83,26,539
Total, Irrigation and Navigation	2,06,13,315	..	1,96,37,127	1,99,54,664	12,82,643	2,12,37,307	1,32,41,685	3,44,78,992

TABLE III.—Main heads of Revenue and Working Expenses for the year ended 31st March 1906.

—	Revenue.										Working expenses.				
	Irrigation.										Revenue management.				
											Establishment charges.				
	Water-rates directly paid.	Share of land revenue.	Total.	Navigation.	Plantations and land.	Water power.	Miscellaneous.	Total.	Remission of revenue.	Net revenue.	Direction.	Execution.	Navigation.	Civil officers.	Total revenue management.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MAJOR WORKS.	RS.	RS.	RS.	RS.	RS.		RS.	RS.	RS.	RS.	RS.	RS.		RS.	RS.
PRODUCTIVE WORKS.															
Irrigation Works.															
Gódávari delta system	34,21,084	1,86.330	36,07,414	91,510	14,372	..	6,474	37,19,770	180	37,19,590	43,246	1,72,986	..	1,80,313	3,96,545
Kistna do.	29,94,677	1,25,548	31,20,225	43,860	12,170	..	14,836	31,91,091	24	31,91,067	37,354	1,49,414	..	1,55,275	3,42,043
Cauvery do.	8,58,685	1,19,321	9,78,006	..	497	..	828	9,79,331	..	9,79,331	10,331	41,322	..	48,900	1,00,553
Pennar river canal system	3,99,960	46,749	4,46,709	..	528	..	2,058	4,49,295	50	4,49,245	4,852	19,405	..	21,999	46,256
Srívaikuntam anicut system ..	1,22,423	1,581	1,24,004	..	..	..	2,968	1,26,972	16	1,26,956	1,528	6,114	..	6,200	13,842
Kurnool-Cuddapah canal	1,95,236	..	1,95,236	929	.	..	8,026	2,04,191	66	2,04,125	2,522	10,088	..	9,761	22,371
Barur tank project	11,845	628	12,473	..	..	..	63	12,536	..	12,536	143	574	..	605	1,322
Periyár project	4,71,490	37,584	5,09,074	336	717	..	2,873	5,13,000	46	5,12,954	5,736	22,946	..	24,045	52,727
Total ..	84,75,400	5,17,741	89,93,141	1,36,635	28,284	..	38,126	91,96,186	382	91,95,804	1,05,712	4,22,849	..	4,47,098	9,75,659
PROTECTIVE WORKS.															
Rushikulya project	1,08,590	2,689	1,11,279	..	326	..	459	1,12,064	..	1,12,064	16	62	..	5,534	5,612
MINOR WORKS AND NAVIGATION.															
IRRIGATION WORKS.															
Chembrambakam tank	15,704	848	16,552				10	16,562	..	16,562	..	1	..	828	829
Pálár anicut	1,37,155	17,101	1,54,256	..	..	..	4,861	1,59,117	..	1,59,117	97	389	..	7,673	8,159
Pelandorai anicut	38,352	36	38,388	..	27	..	488	38,903	..	38,903	10	41	..	1,920	1,971
Madras water-supply and irrigation extension project	10,325	458	10,783	..	..	..	24,333	35,116	4	35,112	487	1,947	..	539	2,973
Lower Coleroon anicut	2,34,713	51,818	2,86,531	..	694	..	1,780	2,89,005	1	2,89,004	50	198	..	14,327	14,575
Shatiatope do.	94,173	15,252	1,09,425	..	281	..	348	1,10,054	..	1,10,054	13	50	..	5,471	5,534
Vriddhachalam do.	21,300	291	21,591	..	42	..	19	21,652	..	21,652	1	5	..	1,080	1,086
Mehamattur do.	12,746	35	12,781	..	15	..	97	12,893	..	12,893	2	9	..	639	650

Table III.—Main heads of Revenue and Working Expense for the year ended 31st March 1906—*cont.*

—	Working expenses—*cont.* Maintenance of works. Establishment charges. Direction.	Execution.	Medical.	Total.	Works.	Repairs.	Tools and plant.	Plantations.	Total maintenance.	Total, direct charges.	Indirect charges.	Grand total, Working expenses.
	17	18	19	20	21	22	23	24	25	26	27	28
MAJOR WORKS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
PRODUCTIVE WORKS.												
Irrigation Works.												
Gódávari delta system	12,832	51,330	..	64,162	20,520	2,85,845	1,64,526	1,399	5,36,552	9,33,097	39,255	9,72,352
Kistna do.	14,165	56,660	..	70,825	31,154	2,95,773	95,705	561	4,94,018	8,36,061	36,063	8,72,124
Cauvery do.	— 301	— 1,208	..	— 1,509	20,490	— 2,200	— 570	..	16,211	1,16,764	7,626	1,24,390
Pennar river canal system	2,266	9,066	..	11,332	6,909	44,733	— 101	..	62,873	1,09,129	7,168	1,16,297
Srivaikuntam anicut system	68	270	..	338	294	2,720	238	..	3,590	17,432	1,117	18,549
Kurnool-Cuddapah canal	2,237	8,947	..	11,184	4,166	45,954	1,364	70	62,738	85,109	3,331	88,440
Barur tank project	219	878	..	1,097	598	4,323	37	..	6,055	7,377	254	7,631
Periyár project	480	1,921	..	2,401	10,881	54,366	2,138	..	69,786	1,22,513	4,352	1,26,865
Total ..	31,966	1,27,864	..	1,59,830	95,012	7,31,614	3,63,337	2,030	12,51,823	22,27,482	99,166	23,26,648
PROTECTIVE WORKS.												
Rushikulya project	1,664	6,656	..	8,320	3,531	35,401	383	..	47,635	53,247	1,176	54,423
MINOR WORKS AND NAVIGATION.												
IRRIGATION WORKS.												
Chembrambakam tank	278	1,111	..	1,389	634	5,403	119	..	7,545	8,374	195	8,569
Palár anicut	11,496	45,986	..	57,482	1,94,117	56,091	— 4	92	3,07,778	3,15,937	8,161	3,24,098
Pelandorai anicut	398	1,591	..	1,989	1,407	7,535	— 2	..	10,929	12,900	286	13,186
Madras water-supply and irrigation extension project	173	693	..	866	— 2,321	6,471	1	..	5,017	7,990	462	8,452
Lower Coleroon anicut	2,312	9,246	..	11,558	12,364	40,191	72	407	64,592	79,167	2,175	81,342
Shatiatope anicut	957	3,827	..	4,784	6,402	14,600	3	..	25,789	31,323	724	32,047
Vriddhachalam	221	881	..	1,102	695	4,095	5	..	5,897	6,983	155	7,138
Mehamattur	134	535	..	669	68	2,880	— 10	..	3,607	4,257	95	4,352

Table III.—Main heads of Revenue and Working Expenses for the year ended 31st March 1906—*cont.*

—	Revenue.										Working expenses.				
	Irrigation.										Revenue management.				
											Establishment charges.				
	Water-rates directly paid.	Share of land revenue.	Total.	Naviga-tion.	Planta-tions and land.	Water power.	Miscel-laneous.	Total.	Remission of revenue.	Net revenue.	Direction.	Execution.	Navi-gation.	Civil officers.	Total Revenue manage-ment.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
MINOR WORKS AND NAVIGATION—*cont.*	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
IRRIGATION WORKS—*cont.*															
Tirukkóyilúr anicut	37,924	3,310	41,234	..	875	..	705	42,814	..	42,814	32	126	..	2,062	2,220
Cumbum tank	— 575	503	— 72	..	..	..	..	— 72	..	— 72	..	..	..	— 4	— 4
Vallur anicut	1,254	1,084	2,338	..	..	..	13	2,351	..	2,351	..	1	..	117	118
Marudur anicut	72,800	248	73,048	..	..	..	308	73,356	..	73,356	6	25	..	3,652	3,683
Thadapalle channel	39,162	2,803	41,965	..	..	..	931	42,896	10	42,886	19	74	..	2,098	2,191
Arkenkota do.	9,648	435	10,083	..	..	..	35	10,118	..	10,118	1	3	..	504	508
Kalingaroyen channel	24,161	459	24,620	..	19	..	772	25,411	..	25,411	16	63	..	1,231	1,310
Cheyar anicut	41,779	3,280	45,059	..	..	..	762	45,821	..	45,821	15	60	..	2,252	2,327
Poiney do.	40,936	4,983	45,919	..	..	..	160	46,079	..	46,079	3	13	..	2,294	2,310
Dondapad tank	49	8	57	..	..	..	54	111	..	111	1	4	..	2	7
Sagileru project	3,760	19	3,779	..	..	..	11	3,790	..	3,790	..	1	..	189	190
Muniyeru do.	7,148	560	7,708	..	164	..	97	7,969	..	7,969	5	21	..	386	412
Nandyar channel extension ..	2,987	50	3,037	..	122	..	..	3,159	..	3,159	3	9	..	152	164
Ganjám minor river system ..	46,067	7,384	53,451	..	— 5	..	1,205	54,651	..	54,651	24	97	..	2,673	2,794
Chopad project	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Jangamaheswarapuram tank ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Vamula project	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Total, Irrigation ..	8,91,568	1,10,965	10,02,533	..	2,234	..	36,989	10,41,756	15	10,41,741	785	3,137	..	50,085	54,007
NAVIGATION WORKS.															
Buckingham canal	..	..	..	64,446	..	..	1,135	65,581	13	65,568	1,312	5,246	..	..	6,558
Chilka lake canal	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Ganjám-Gopalpur canal	..	..	..	..	5	..	21	26	..	26	..	3	..	..	3
Védáranniyam canal	..	..	..	1,074	4	..	34	1,112	..	1,112	22	89	..	..	111
Total, Navigation ..	..	..	..	65,520	9	..	1,190	66,719	13	66,706	1,334	5,338	..	..	6,672
Total, Irrigation and Navigation ..	8,91,568	1,10,965	10,02,533	65,520	2,243	..	38,179	11,08,475	28	11,08,447	2,119	8,475	..	50,085	60,679

Table III.—Main heads of Revenue and Working Expenses for the year ended 31st March 1906—*cont.*

—	Working expenses—*cont.* Maintenance of works. Establishment charges. Direction.	Execution.	Medical.	Total.	Works.	Repairs.	Tools and plant.	Plantations.	Total maintenance	Total direct charges.	Indirect charges.	Grand total, Working expenses.
	17	18	19	20	21	22	23	24	25	26	27	28
MINOR WORKS AND NAVIGATION—*cont.*	RS.	RS.		RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
IRRIGATION WORKS—*cont.*												
Tirukkóyilúr anicut	1,612	6,449	..	8,061	5,003	30,093	31	..	43,188	45,408	1,151	46,559
Cumbum tank	31	125	..	156	661	606	— 12	..	1,411	1,407	22	1,429
Valluru anicut	41	165	..	206	— 226	1,122	— 19	..	1,083	1,201	29	1,230
Marudar anicut	— 46	— 184	..	— 230	350	— 441	— 72	..	— 393	3,290	— 28	3,262
Thadapalle channel	371	1,484	..	1,855	171	7,997	20	..	10,043	12,234	273	12,507
Arkenkota do.	160	639	..	799	188	3,286	..	..	4,273	4,781	112	4,893
Kalingaroyen channel	186	743	..	929	139	4,089	..	..	5,157	6,467	141	6,608
Cheyár anicut	709	2,838	..	3,547	1,001	14,481	..	..	19,029	21,356	507	21,863
Poiney do.	616	2,464	..	3,080	577	13,025	2	..	16,684	18,994	552	19,546
Dondapad tank	21	85	..	106	..	464	..	..	570	577	16	593
Sagiléru project	213	852	..	1,065	1,403	3,357	..	..	5,825	6,015	149	6,164
Muniyeru do.	267	1,067	..	1,334	277	5,550	37	..	7,198	7,610	190	7,800
Nandiyar channel extension	84	336	..	420	294	1,533	120	..	2,367	2,531	60	2,591
Ganjám minor river system	1,556	6,224	..	7,780	11,345	23,436	..	..	42,561	45,355	1,106	46,461
Chapad project	35	139	..	174	..	964	..	..	1,138	1,138	24	1,162
Jangamaheswarapuram tank ..	..	3	..	3	..	12	..	..	15	15	..	15
Vamula project	7	27	..	34	301	..	..	..	335	335	5	340
Total, Irrigation ..	21,832	87,326	..	1,09,158	2,34,850	2,46,840	291	499	5,91,638	6,45,645	16,562	6,62,207
NAVIGATION WORKS.												
Buckingham canal	2,936	11,741	..	14,677	514	63,172	5,275	253	83,891	90,449	2,973	93,422
Chilka Lake canal	13	49	..	62	..	268	..	..	330	330	9	339
Ganjám-Gopalpur canal	14	57	..	71	..	37	..	270	378	381	10	391
Védáranniyam canal	323	1,289	..	1,612	383	6,624	233	..	8,852	8,963	241	9,204
Total, Navigation ..	3,286	13,136	..	16,422	897	70,101	5,508	523	93,451	1,00,123	3,233	1,03,356
Total, Irrigation and Navigation ..	25,118	1,00,462	..	1,25,580	2,35,747	3,16,941	5,799	1,022	6,85,089	7,45,768	19,795	7,65,563

II

Note by the Chief Engineer for Irrigation.

The Examiner, Public Works Accounts, forwards statements of the financial results of Irrigation and Navigation works during 1905–1906 for submission to the Government of India and states that the entries in columns 2 and 3 and those in columns 16 to 20 of table I for the Kurnool-Cuddapah canal have not been made, as the information required to make these entries is not available in his office. These omissions have been supplied by this office.

16*th October* 1906.

C. A. SMITH,
Ag. Chief Engineer for Irrigation.

Order—No. 1079 I., dated 19th October 1906.

Ordered that a copy of these Proceedings together with the statements received from the Examiner, Public Works Accounts, be forwarded to the Government of India.

[Here enter No. 1080 I., dated 19th October 1906.]

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, all Superintending Engineers.
,, the Examiner, Public Works Accounts.
,, the Revenue Department.

Endorsement—No. 1080 I., dated 19th October 1906.

Forwarded.

(By order.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1081 I., 23rd October 1906.

Kalingaroyen Channel, Coimbatore District

The original cost (Rs. 9) of the old pipes proposed to be replaced in connection with improvements to the —, ordered to be written back from the Capital to the Revenue account of the channel system.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

G.O., No. 853 I., dated 7th August 1906.

II

From the Superintending Engineer, IV Circle, dated 13th October 1906, No. 272-I/410-B.

Order—No. 1081 I., dated 23rd October 1906.

With reference to paragraph 3 of the order quoted above the Superintending Engineer, IV Circle, now reports that the original cost of the old pipes proposed to be replaced is Rs. 9, which will be written back by the Examiner, Public Works Accounts, from the Capital to the Revenue account of the Kalingaroyen channel system.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, IV Circle.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*
Regd.		*Spare copies*

G.O., No. 1082 I., 23rd October 1906.

Funds

Allotting from the reserve a sum of Rs. 500 for the Cuddapah-Anantapur Investigation Party.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers:—

I

Letter—from H. E. CLERK, Esq., Superintending Engineer on Special duty.
To—the Chief Engineer for Irrigation.
Dated—Madras, the 8th October 1906.
No.—1959.

In supersession of my grant modification statement submitted with my endorsement No. 1751, dated 12th September 1906, proposing to surrender Rs. 8,000 from the grants allotted for my investigations during the current year, I have the honour to request that you will be good enough to retain Rs. 3,000 and to arrange (as my office exists no more) for its being added to the existing allotments under "Works" and "Tools and Plant" of the Cuddapah-Anantapur Investigation Party as follows:—

Works.			Tools and plant		
Existing allotment.	Additional allotment (proposed above).	As revised.	Existing allotment.	Proposed addition.	Revised allotment.
RS.	RS.	RS.	RS.	RS.	RS.
3,000	2,700	5,700	800	300	1,100

2. The above modification is now rendered necessary by the fact that the existing grants for the party under "Works" and "Tools and Plant" are exceeded by the sum total of—

(1) the "works" estimate of Rs. 2,900 forwarded to you, for sanction, with my No. 1919, dated 3rd October 1906;

(2) the "works" estimate of Rs. 1,900 forwarded to you, for sanction, with my No. 1918, dated 3rd October 1906;

(3) the "works" estimate of Rs. 700 forwarded to you, for sanction, with my No. 1917, dated 3rd October 1906;

(4) "Tools and Plant" estimate of Rs. 500 sanctioned in my No. 1903, dated 3rd October 1906 (new supplies); and

(5) Tools and Plant (repairs and carriage), estimate of Rs. 500 sanctioned in my No. 1902, dated 3rd October 1906.

II

Note by the Chief Engineer for Irrigation.

In his letter read above the Superintending Engineer on Special duty states that an additional grant of Rs. 3,000 is required for the Cuddapah-Anantapur Investigation Party and that it may be provided from the sum of Rs. 8,000 surrendered by him from the grant for the Chingleput Investigation Party and dealt with in G.O., No. 1027 I., dated 25th September 1906. A sum of Rs. 2,500 has already been provided in G.O., No. 1072 I., dated 15th October 1906, under "Works" for the above party and the balance of Rs. 500 now required may be allotted from the reserve, which will then be reduced to Rs. 34,400.

17th October 1906.

C. A. SMITH,
Ag. Chief Engineer for Irrigation.

Order—No. 1082 I., dated 23rd October 1906.

The following transfer of funds is sanctioned :—

Imperial Works.

35. Construction of Protective Irrigation Works.

From	RS.	*To*	RS.
Reserve works	500	Cuddapah and Anantapur Investigation Party.	
		Works	200
		Tools and plant	300
		Total ...	500

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Examiner, Public Works Accounts.
" Superintending Engineer, III Circle.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1083 I., 23rd October 1906.

Funds

A sum of Rs. 120 from the reserve under the head "35. Protective Irrigation Works" placed at the disposal of the Collector of Vizagapatam towards the cost of the temporary entertainment of a clerk for the preparation of estimates for famine-relief works in the Vizagapatam Agency.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

G.O., R. No. 145 W., dated 5th October 1906.

Read—the following paper :—

Proceedings of the Board of Revenue (R.S., L.R. and Agri.), Mis. No. 4712, *dated* 5*th August* 1906.

Read—the following papers :—

Letter—from the Collector of Vizagapatam.
To—the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture.
Dated—the 27th May 1906.
No.—R.C. 1494.

I have the honour to state that the programme of famine-relief works for 1906–1907 contains several new roads proposed to be executed by famine labour. Detailed estimates have to be prepared for all of them, but their preparation involves much labour and time, as they have to be prepared in such a way as to satisfy the rules of the Public Works Department Code. The Local Fund Engineer informs me that the time required for a complete survey with levels and all necessary calculations and plan drawing, etc., would be ten days per mile for one man. At this rate it would take several years to get estimates prepared for all the new roads shown in the programme, unless a large and costly establishment is maintained. The cost of acquiring the lands required for these new roads will, moreover, be very heavy and it will also be difficult to maintain them after they are completed, as the finances of the District Board do not admit of any large extension of roads. Under the circumstances, I think it is preferable to undertake the complete remetalling and gravelling of the existing roads rather than to construct new roads. Though the preparation of these remetalling estimates requires no professional skill, it cannot be done without the assistance of a clerk on Rs. 20 per mensem for six months, as the Local Fund Engineer represents that his present establishment is already overworked, and that it cannot cope with the special work in addition to the ordinary current work. These "remetalling" estimates are calculated to provide labour for nearly 12 per cent. of the population for six months, and it is desirable that they should be completed without delay and included in the Famine Programme. I therefore recommend that the entertainment of a clerk on Rs. 20 for six months may be sanctioned, with reference to Board's Proceedings, No. 89, Revenue Settlement, dated 19th March 1906.

Board's Reference thereon, No. 2253, *dated* 13*th June* 1906.

The Collector is requested to submit the necessary proposition statement (in duplicate) for the temporary establishment referred to in the letter read above.

Letter—from the Collector of Vizagapatam.

To—the Secretary to the Commissioner of Revenue Settlement and Director of the Department of Land Records and Agriculture.

Dated—the 8th July 1906.

No.—R.C. 1494.

Adverting to Board's Reference No. 2253, dated 13th June 1906, I have the honour to send, herewith, a proposition statement in duplicate for the temporary establishment referred to therein.

Endorsement from the Accountant-General, Madras, No. T. 188/*Viz.* 4979, *dated* 27*th July* 1906.

Forwarded to the Board.

Resolution—Mis. No. 4712, *dated* 5*th August* 1906.

Forwarded to the Chief Engineer, Public Works Department, for favour of necessary action.

(True Extract.)

L. D. SWAMIKANNU,
Acting Secretary.

To the Chief Engineer, Public Works Department, with a proposition statement in duplicate.
Copy to the Collector of Vizagapatam.

Order—R. No. 145 *W., dated* 5*th October* 1906.

In the circumstances explained sanction is accorded to the entertainment, for a period of six months, of a clerk on Rs. 20 *per mensem* in connection with the preparation of estimates for famine-relief works in the Vizagapatam district.

2. Under the ruling contained in the letter from the Government of India No. 291–15–2, dated 10th February 1906 (*vide* G.O., No. 191, Revenue, dated 28th February 1906), the cost will be debited to "35. Protective Irrigation Works".

(True Extract.)

J. P. DAVIDSON,
Secretary to Government.

To the Superintending Engineer, I Circle.
,, Chief Engineer for Irrigation.
,, Examiner, Public Works Accounts.
,, Revenue Department.

Order—No. 1083 I., dated 23rd October 1906.

With reference to paragraph 2 of the order read above a sum of Rs. 120 is placed, under the head establishment, at the disposal of the Collector of Vizagapatam from the reserve at the disposal of Government under the head "35. Protective Irrigation Works" which will thereby be reduced to Rs. 34,900.

(True Extract.)

C. A. SMITH,
Ag. Joint Secretary to Government,
Irrigation Branch.

To the Collector of Vizagapatam.
,, Chief Engineer for Irrigation.
,, Superintending Engineer, I Circle.
,, Examiner, Public Works Accounts.
,, Revenue Department.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*	
Regd.		*Spare copies*	

G.O., Nos. 1088, 1089 I., 26th October 1906.

East main channel in the foreshore of the Kilakuppam tank, Barur tank system, Salem District

Forwarding a copy of the Proceedings sanctioning an estimate, amounting to Rs. 2,136, for the diversion of the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

From the Superintending Engineer, IV Circle, dated 19th September 1906, No. 257 I.
„ IV „ „ 9th October „ „ 270 I.

ENCLOSURE.

Report to accompany the estimate for the proposed diversion of the East main channel in the foreshore of Kilakuppam tank.

	RS.
Amount of estimate	1,710

The East main channel of Barur tank at about 400 feet from its head enters the Kilakuppam tank whose original ayacut has been brought under the direct irrigation of the channel. The existence of this tank is therefore a hindrance to the systematic and prompt irrigation of the lands in the lower reaches of the channel, as every time the head sluice is opened some valuable time is lost in filling up the tank before water can pass down the channel. In addition to this water percolates through the tank bund owing to the porous nature of the soil with which it is made and the quantity so wasted is considerable. It is therefore proposed to divert the channel in the foreshore of the (Kilakuppam) tank—an arrangement by which not only the objection in the matter of regulation of water in the channel will be removed but much percolation of water referred to above will be prevented. The tank bed when sold in auction will further fetch a material profit to Government and go far to compensate for the proposed outlay.

2. Two pipe sluices—one at 1,000 feet and the other at 2,900 feet below the head, are proposed to be constructed for the irrigation of the tank bed and the original ayacut under the tank which is now irrigated by a sluice in the tank bund.

3. A dry stone inlet will also be built at 2,600 feet to drain into the channel the discharge from a catchment of 0·25 square mile. It is proposed to make use of the old revetment of the tank bund for this work. The right bank of the channel will be connected with the right wing of the weir at the left flank of the tank (*viae* sketch) so as to utilise that work as an outlet for the channel.

4. Almost the whole of the new diversion will be confined to the tank-bed poramboke land, while for a very short length of it, however, which necessarily touches the patta land in alignment an extent of 0·26 acre of dry land will be acquired and for which land plan and schedule are attached.

I have inspected the channel and consider the proposed diversion to be necessary and advantageous.

Early sanction is requested to the estimate.

7th August 1906.

J. INGLIS,
Executive Engineer, Salem Division.

II

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, IV Circle, submits an estimate, amounting to Rs. 1,710, for the diversion of the East main channel in the foreshore of the Kilakuppam tank, Barur tank system. It is stated that, at present, the channel enters the Kilakuppam tank at about 400 feet from its head and that this tank on account of its position and the porous nature of its bund, acts prejudicially to the irrigation of the lands lower down the channel. It is therefore proposed to abandon the tank and to irrigate its bed and the original ayacut under it directly from the channel by means of two pipe sluices that will be constructed in the proposed diversion, one at 1,000 feet and the other at 2,900 feet below the head of the channel. The estimate also provides for the construction of an inlet at 2,600 feet in order to pass off into the channel the discharge from a catchment of 0·25 square mile.

The amount of the estimate has been increased in this office to Rs. 1,740 owing to the sloping wings now added to the retaining wall in front of the proposed pipe sluices. It is recommended that the estimate, as altered, be sanctioned under the open capital account of the system.

2. It is not stated if the amount of Rs. 20, provided in the estimate, for compensation for land (0·25 acre) required for a portion of the proposed diversion of the channel, has been fixed in consultation with the local revenue officers, but, as the extent is very small, the Executive Engineer's valuation may be accepted.

C. A. SMITH,
Ag. Chief Engineer for Irrigation.

16*th October* 1906.

Order—No. 1088 I., dated 26th October 1906.

The following estimate is sanctioned :—

Provincial.

Irrigation.

43. Minor works and Navigation.

Class II. Minor works and Navigation for which Capital and Revenue accounts are kept.

Barur tank system.

Open Capital Account.

I. Works.

2. Main Canals and Branches.

Unremunerative work.

Diversion of the East main channel in the foreshore of the Kilakuppam tank.

Estimate—	RS.
B. Land—	
Compensation for land...	20
D. Regulators—	
Constructing two pipe sluices	310
E. Falls and weirs—	
Constructing a dry stone inlet	40
L. Earthwork—	
Excavation including sectioning, banking, etc.	1,275
O. Miscellaneous—	
Contingencies and supervision	95
Total, I. Works ...	1,740
II. Establishment ...	396
Grand Total ...	2,136

2. This sanction is registered as No. 166 I. of 1906-1907, and will expire on 31st March 1907.

3. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 1089 I., dated 26th October 1906.]

(True Extract.)

C. A. SMITH,
Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, IV Circle, with plans and estimate.
,, Examiner, Public Works Accounts.

Endorsement—No. 1089 I., dated 26th October 1906.

Forwarded.

(By order.)

C. A. SMITH,
Joint Secretary to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., Nos. 1090, 1091 I., 26th October 1906.

Girder bridge over Pedda Thummidi drain, Kistna Eastern Delta

Forwarding a copy of the Proceedings sanctioning an estimate, amounting to Rs. 8,549, for constructing a — .

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

From the Superintending Engineer, II Circle, dated 9th July 1906, No. 276 W.

ENCLOSURE.

Report to accompany the estimate for constructing a girder bridge over Pedda Thummidi drain.

	RS.
Amount of estimate	6,950

Pedda Thummidi drain, which has a catchment area of 10 square miles above, crosses the main road from Bantumalli to Gudivadá at 2/5 of the road. At present, there is only a road dam by which the large and continued traffic can cross the drain, and as the depth of the drain is 4 feet, a great amount of inconvenience is caused. As the Local Fund Department are now metalling this road, it is proposed to construct a girder bridge of 2 spans of 20 feet each over the drain, the cost of which will have to be borne by this department, as the road existed prior to the excavation of the drain. The hydraulic calculations are given in the accompanying plan.

13*th May* 1906.

C. PEDDIE,
Exe. Engr., Kistna Eastern Divn.

II

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, II Circle, submits an estimate, amounting to Rs. 6,950, for constructing a girder bridge, with 2 spans of 20 feet each, over Pedda Thummidi drain, Kistna Eastern Delta, at the point where the main road from Bantumalli to Gudivadá crosses the drain. It is stated that there is heavy traffic at this place and that considerable inconvenience is experienced in crossing the drain by the existing road dam owing to 4 feet of water passing down the drain. The road having existed prior to the excavation of the drain which was only completed in 1898, the cost of the proposed bridge may be considered as chargeable to Irrigation funds in accordance with rules I and IV approved in G.O., No. 61 I., dated 31st January 1880. It is, therefore, recommended that the estimate be sanctioned against the Open Capital Account of the Kistna Delta System.

2. The work is classed as "unremunerative" and will probably be completed by 31st March 1908.

15*th October* 1906.

C. A. SMITH,
Ag. Chief Engineer for Irrigation.

Order—No. 1090 I., dated 26th October 1906.

The following estimate is sanctioned :—

Imperial
Capital expenditure not charged to Revenue.
49. Irrigation.
Kistna Delta System.
Eastern Division.
Open Capital Account.
I. Works.
4. Drainage and Protective Works.
C. Works.
Unremunerative work.
Constructing a girder bridge over Pedda Thummidi drain.

Estimate—

		RS.
I. Works	... ...	6,950
II. Establishment	... ...	1,599
	Total ...	8,549

This sanction is registered as No. 167 I. of 1906-1907 and will expire on the 31st March 1908.

Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 1091 I., dated 26th October 1906.]

(True Extract.)

C. A. SMITH,
Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle, with plans and estimate.
" Examiner, Public Works Accounts.

Endorsement—No. 1091 I., dated 26th October 1906.

Forwarded.

(By Order.)

C. A. SMITH,
Joint Secretary to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1092 I., 26th October 1906.

Transfer of funds

Certain — under Provincial, Irrigation, 43. Minor Works and Navigation in the Chingleput division, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

Application for modification of existing grants under Provincial, Irrigation, for the year 1906–1907.

Item number.	Division.	Works.	Amount of estimate.	Original grant.	Existing grant.	Modification proposed. Decrease.	Modification proposed. Increase.	Revised grant.	Remarks.
		43. MINOR WORKS AND NAVIGATION FOR WHICH CAPITAL AND REVENUE ACCOUNTS ARE KEPT.		RS.	RS.	RS.	RS.	RS.	
		REVENUE ACCOUNT.							
		Extensions and Improvements.							
1	Chingleput ..	Pálár aniout system ..	..	3,500	3,500	1,200	..	2,300	Not required as there is no work in hand.
		Maintenance and Repairs.							
2	Do. ..	Madras water-works system.	..	5,000	6,500	..	1,200	7,700	The estimate of works in progress amounts to Rs. 7,850 and Rs. 1,200 is required to meet out the expenditure on the works.

No. 453 *E.I., dated* 10*th October* 1906.

Submitted to the Chief Engineer for Irrigation, with request that he will be so good as to obtain the sanction of Government to the modifications herein applied for.

W. M. ELLIS, Lieut.-Col., R.E.,
Superintending Engineer, V Circle.

Order—No. 1092 I., dated 26th October 1906.

The following transfer of funds is sanctioned :—

Provincial.
Irrigation.
43. Minor Works and Navigation.
Class II. Works for which Capital and Revenue Accounts are kept.
Revenue Account.
Chingleput Division.

From Pálár anicut system.		*To* Madras water-supply and Irrigation extension.	
	RS.		RS.
Extensions and improvements ...	1,200	Maintenance and repairs	1,200
Establishment	276	Establishment	276
Total ...	1,476	Total ...	1,476

(True Extract.)

C. A. SMITH,
Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, V Circle.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd.	1906.	*Enclosures*	
Regd.		*Spare copies*	

G.O., No. 1093 I., 26th October 1906.

Transfer of funds

Certain — under Imperial, Irrigation, 42. Major Works—Working Expenses from the Reserve to the Kistna Delta System, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following paper :—

Application to the Superintending Engineer, II Circle, for a reappropriation of budget grants.

Proposed new grant.

Departmental and service head.	Item number of budget.	Works.	Amount of estimate.	Outlay to end of previous year.	Original grant for current year.	Existing grant for current year.	Proposed increase.	Grant as now proposed.
					RS.	RS.	RS.	RS.
42. Major Works—Working Expenses—Kistna Delta System.	1	Extensions and Improvements	..	..	10,000	10,000	9,000	19,000
	2	Maintenance and Repairs	..	..	1,10,000	1,10,000	30,000	1,40,000

EXPLANATION OF NECESSITY FOR REAPPROPRIATION.

Under Extensions and Improvements.—Large number of works have been sanctioned during the current official year and in the latter part of past official year. The sum of Rs. 10,000 provided in the current year's budget will not therefore be sufficient to meet the demand. The additional grant now applied for is essentially necessary. The expenditure up to August 1906 under this head is Rs. 9,841 against the grant of Rs. 10,000.

Under Maintenance and Repairs.—The amount of scheme estimates including special estimates sanctioned during the year comes to Rs. 1,55,000. The additional allotment now applied for is required to meet the expenditure on these works. The expenditure up to August 1906 is Rs. 94,417 against the grant of Rs. 1,10,000.

The expenditure under these two heads will be restricted to the grant until the additional allotments are sanctioned.

No. 280 *S., dated the* 3rd *October* 1906.

Forwarded to the Superintending Engineer, II Circle, for sanction if approved.

V. GOPALAYYA,
Ex. Engr., Kistna Western Divn.

No. 380 *I., dated* 12*th October* 1906.

Forwarded to the Chief Engineer for Irrigation for favour of sanction.

A. C. LANGSTON,
Superintending Engineer, II Circle.

Order—No. 1093 I., dated 26th October 1906.

The following transfer of funds is sanctioned :—

Imperial.

Irrigation.

42. Major Works—Working Expenses.

From	RS.	*To*	RS.
Reserve—		Kistna Delta System—Western Division—	
Maintenance and Repairs ...	39,000	Extensions and Improvements ...	9,000
Establishment	8,970	Maintenance and Repairs ...	30,000
		Total ...	39,000
		Establishment	8,970
Total ...	47,970	Total ...	47,970

(True Extract.)

C. A. SMITH,
Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, II Circle.
,, Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1095 I., 26th October 1906.

Transfer of funds

Certain — under Provincial, Irrigation, 43. Minor Works and Navigation in the II and III Circles, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

From the Superintending Engineer, II Circle, dated 21st Sept. 1906, No. 343 I.
" " II " " 21st " " " 347 I.
Telegram to Superintending Engineers, III and VI Circles, dated 27th Sept. 1906.
" from the Superintending Engineer, III Circle, dated 29th Sept. 1906.
From the Superintending Engineer, III Circle, dated 29th Sept. 1906, No. 4747.
Telegram to the Superintending Engineer, VI Circle, dated 4th October 1906.
" from the " VI " " 5th " "
" to the " III " " 6th " "
" from the " III " " 6th " "
From the Superintending Engineer, II Circle, dated 13th October 1906, No. 385 I.

Order—No. 1095 I., dated 26th October 1906.

The following transfers of funds are sanctioned :—

Provincial.
Irrigation.
43. Minor Works and Navigation.

From

Class II. Minor Works for which Capital and Revenue Accounts are kept.
Capital Account.
Muniyeru Project.

	RS.	RS.
Works	2,500	
Establishment	575	
		3,075

Kurnool-Cuddapah Canal.
Kurnool Division.
Extension of Harivaram Channel.

	RS.	RS.
Works	2,307	
Establishment	531	
		2,838

Revenue Account.
Muniyeru Project.

	RS.	RS.
Extensions and improvements	1,300	
Maintenance and repairs ...	2,500	
	3,800	
Establishment	874	
		4,674

To

Class II. Minor Works for which Capital and Revenue Accounts are kept.
Revenue Account.
Jangamaheswarapuram Tank Project.

	RS.	RS.
Maintenance and repairs ...	85	
Establishment	20	
		105

Atmakur Tank Project.

	RS.	RS.
Maintenance and repairs ...	70	
Establishment	16	
		86

Class IV. Other Minor Works for which neither Capital nor Revenue nor Individual Accounts are kept.
(*a*) In charge of Public Works Department.
Divi Pumping Project Division.

	RS.	RS.
Repairs	2,460	
Establishment	566	
Tools and plant	37	
		3,063

From	RS.	RS.	*To*	RS.	RS.
Dondapad Tank Project.			Class V. Agricultural Works. Kistna Central Division.		
Maintenance and repairs ...	400		Repairs	14,582	
Establishment	92		Divi Project Division.		
		492	Repairs	1,636	
Class IV. Other Minor Works for which neither Capital nor Revenue nor Individual Accounts are kept.				16,218	
(*a*) In charge of Public Works Department.			Establishment	3,730	
Minor Original Works—			Tools and plant	243	
Bellary division	2,200				20,191
Kistna Northern division...	600				
Reserve	5,983				
Repairs—					
Kistna Northern	950				
	9,733				
Establishment	2,238				
Tools and plant	146				
		12,117			
Class V. Agricultural Works. Kistna Northern Division.					
Repairs	200				
Establishment	46				
Tools and plant	3				
		249			
		23,445			23,445

2. There are no funds at present at the disposal of Government to meet the balance (Rs. 12,418) of the demand of Rs. 27,000 made by the Superintending Engineer, II Circle, under Class V. Agricultural Repairs, Kistna Central division.

(True Extract.)

C. A. SMITH,
Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineers, II and III Circles.
,, the Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., Nos. 1097, 1098 I., 31st October 1906.

No. 3 Thutheri Kunmoy, Periyar Project

Forwarding a copy of the Proceedings sanctioning an estimate, amounting to Rs. 1,464, for improvements to the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers:—

I

Letter—from S. B. Murray, Esq., Superintending Engineer, VI Circle.
To—the Chief Engineer for Irrigation.
Dated—Trichinopoly, the 4th September 1906.
No.—515 C.E.

I have the honour to forward herewith, for your approval and sanction of Government, an estimate, amounting to Rs. 1,190, for improvements to No. 3 Thutheri Kunmoy, a Periyár affected tank, fed by a distributary from the Chunambur offtake of the X Branch channel, in the Mélúr taluk, Madura district.

2. The proposed improvements consist of constructing revetment to the portion of the tank bund which has been very much eroded by wave action.

3. The work may be classed as "unremunerative", but is required for the development of the Periyár project, and will be completed by the 31st March 1907.

4. Early sanction to the estimate is requested.

Enclosure.

Report to accompany the estimate for improvements to No. 3 *Thutheri tank, Mélúr taluk.*

	RS.
Amount of estimate	1,190

This is one of the Periyár affected tanks ordered to be maintained according to G.O., No. 1250 I., dated 15th December 1905. It has an ayacut of 209 acres yielding a revenue of Rs. 1,000.

The descriptive memoir sheet attached shows that the surplus arrangements are adequate to dispose of the total maximum quantity of surplus estimated as likely to enter the tank.

Three masonry sluices were constructed during the last year to command the whole ayacut, under an estimate sanctioned by the Superintending Engineer.

To bring the section of the bund to the standard noted in the memoir sheet, an estimate, amounting to Rs. 340, was sanctioned by the Superintending Engineer under "repairs" and the work is now put in progress.

As can be seen from the level section enclosed the tank bund has been very much eroded owing to the action of waves. It is now proposed to revet the bund to a height of 1 foot above M.W.L. allowing a slope of 1 to 1.

II

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, VI Circle, submits an estimate, amounting to Rs. 1,190, for improving No. 3 Thutheri Kunmoy, Periyár Project. It is stated that the tank has an ayacut of 209 acres yielding a revenue of Rs. 1,000 and is supplied by a distributary from the Chunambur offtake of the X Branch channel of the project. The improvement proposed consists of providing revetment to the portion of the tank bund, which has become very much eroded by wave action. It is recommended that the estimate be sanctioned.

2. The work is classed as "unremunerative" and will probably be completed by 31st March 1907.

26th October 1906.

C. A. Smith,
Chief Engineer for Irrigation.

Order—No. 1097 I., dated 31st October 1906.

The following estimate is sanctioned :—

Imperial.
Capital expenditure not charged to Revenue.
49. Irrigation.
Periyár Project.
Madura Division.
Open Capital Account.
I. Works.
3. Distributaries.
C. Works.
Unremunerative Work.
Improvements to No. 3 Thutheri Kunmoy.

	RS.
Estimate—	
I. Works	1,190
II. Establishment	274
Total ...	1,464

2. This sanction is registered as No. 168 I. of 1906–1907 and will expire on 31st March 1907.

3. Ordered that a copy of these Proceedings be forwarded to the Government of India for information.

[Here enter No. 1098 I., dated 31st October 1906.]

(True Extract.)

C. A. Smith,
Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
,, Superintending Engineer, VI Circle, with plans and estimate.
,, Examiner, Public Works Accounts.

Endorsement—No. 1098 I., dated 31st October 1906.

Forwarded.

(By order.)

C. A. Smith,
Joint Secretary to Government,
Irrigation Branch.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1099 I., 31st October 1906.

Iron ferry ballacut

An estimate, amounting to Rs. 605, for constructing a first-clas, — at 4 miles, 1 furlong of the main canal, Gódávari Easten Delta, sanctioned.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

Read—the following papers:—

I

From the Superintending Engineer, I Circle, dated 12th September 1906, No. 2796-G.E.

Enclosure.

Report accompanying the plan and estimate for constructing a first-class iron ferry ballacut for crossing main canal at 4 miles, 1 furlong opposite to Kadium Railway station.

[*Reference.*—D. Dis. No. 751 of 1906, dated 20th March 1906.]

	RS.
Amount of estimate	605

The accompanying estimate provides for the construction of a first-class iron ballacut for passengers to cross the main canal at 4 miles, 1 furlong. The traffic from Kadium station being heavy, the iron second-class ballacut now in existence at this point of the canal is found insufficient for the traffic.

The existing ballacut which is in good order could on the completion of the new one be sent to take the place of a second-class ballacut which may have been condemned.

W. G. Molesworth,
Executive Engineer, Gódávari Eastern Divin.

3rd July 1906.

II

Note by the Chief Engineer for Irrigation.

The Superintending Engineer, I Circle, submits an estimate, amounting to Rs. 305, for constructing a first-class iron ferry ballacut at 4 miles, 1 furlong of the main canal, Gódávari Eastern delta. It is stated that the existing second-class ballacut, though in good order, is found insufficient to meet the requirements of the heavy traffic at the place and that, when replaced, it can be utilised elsewhere, if wanted.

2. It is observed that the actual cost of the proposed ballacut is Rs. 605, from which the Superintending Engineer has deducted the present estimated value of the existing one. This procedure is, however, incorrect as the materials of the existing ballacut are not proposed to be utilised in the construction of the new one. The estimate has, therefore, been altered in this office to Rs. 605 and is recommended for sanction.

C. A. Smith,
Chief Engineer for Irrigation.

26th October 1906.

Order—No. 1099 I., dated 31st October 1906.

The following estimate is sanctioned :—

Imperial.
Irrigation.
42. Major Works (Working expenses)
Gódávari Delta System.
Eastern Division.
5. Tools and Plant.
4. Navigation Plant.

Constructing a first-class iron ferry ballacut at 4 miles, 1 furlong of the main canal.

	RS.
Estimate	605

2. This sanction is registered as No. 169-I. of 1906–1907.

(True Extract.)

C. A. Smith,
Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, I Circle, with plan and estimate.
" Examiner, Public Works Accounts.

IRRIGATION.
ACCOUNT.

Government of Madras.

PUBLIC WORKS DEPARTMENT.

Recd. } 1906. *Enclosures*

Regd. *Spare copies*

G.O., No. 1102 I., 31st October 1906.

Hajipuram tank Project, Nellore district

The Examiner, Public Works Accounts, authorised to pass the excess outlay of Rs. 351 incurred on the construction of two sluices in the tank bund in connection with the —.

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Irrigation.
Account.

READ—the following papers :—

I

G.O., No. 517 I., dated 14th May 1906.

II

From the Superintending Engineer, II Circle, dated	8th	October	1906,	No.	372-I.
To the Examiner, Public Works Accounts	,, 19th	,,	,,	,,	3851.
From ,, ,,	,, 23rd	,,	,,	,,	5376 B/B.K.

III

Note by the Chief Engineer for Irrigation.

In the revised estimate for the Hajipuram tank Project, Nellore district, sanctioned in the order quoted above, a provision of Rs. 3,400,* was made for the construction of two sluices in the tank bund. The Superintending Engineer, II Circle, now submits an extract from the report of works completed during the month of August 1906 showing an excess outlay of Rs. 351 † on the above works, and states that the excess was due to the higher rates paid and the extra work found necessary in masonry and side walls of the tunnel lined with cutstone. It is recommended that the excess outlay be passed.

	RS.
* No. 1 sluice	1,700
No. 2 ,, ...	1,700
Total ...	3,400

	RS.
† Excess under No. 1 sluice	191
,, ,, 2 ,, ...	160
Total ...	351

29*th October* 1906.

C. A. SMITH,
Chief Engineer for Irrigation.

Order—No. 1102 I., dated 31st October 1906.

The Examiner, Public Works Accounts, is authorised to pass the excess outlay of Rs. 351 referred to in the foregoing note by the Chief Engineer for Irrigation.

2. This sanction is registered as No. 170-I of 1906-1907.

(True Extract.)

C. A. Smith,
Joint Secretary to Government,
Irrigation Branch.

To the Chief Engineer for Irrigation.
" Superintending Engineer, II Circle.
" Examiner, Public Works Accounts.